Vol. 894 Number 4

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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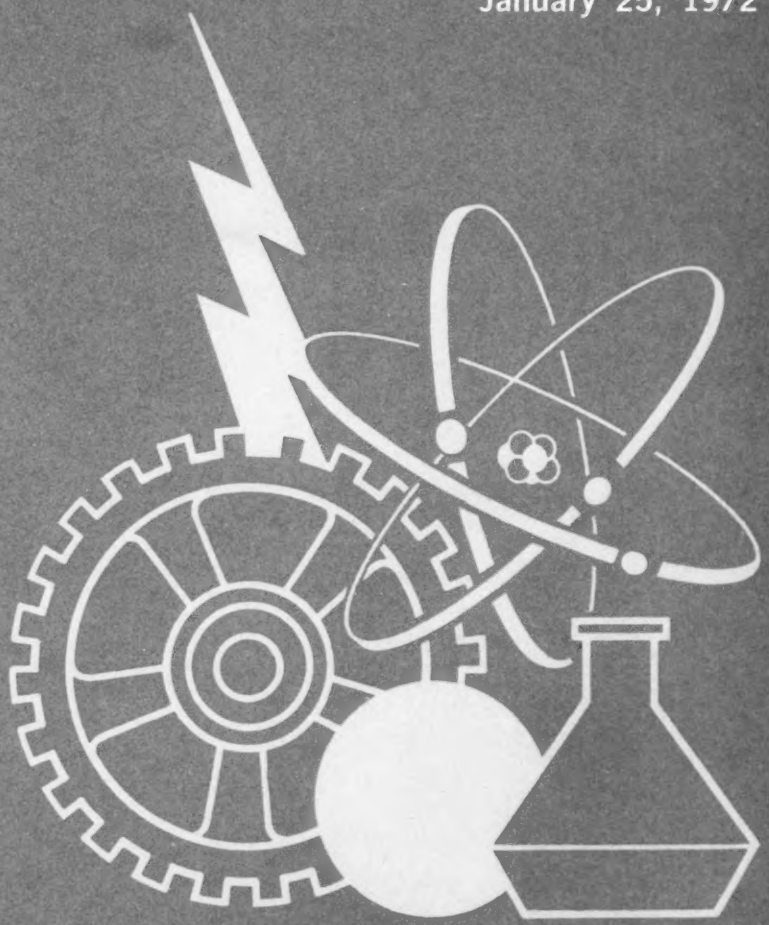
PATENTS

January 25, 1972



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

January 25, 1972 Volume 894 Number 4

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PATENT OFFICE NOTICES

Disclaimers

3,359,122.—*Ralph S. Zebarth* and *Richard A. Bracking*, Kansas City, Mo. METHOD OF PRESERVATION, PACKAGING AND MOLDING OF FRESH FOODS FOR HUMAN USE. Patent dated Dec. 19, 1967. Disclaimer filed Sept. 15, 1971, by the assignee, *Gordon Johnson Company*.

Hereby enters this disclaimer to claims 1–5, inclusive, of said patent.

3,393,455.—*Charles W. MacMillan*, Rock Island, Ill. WHEEL ALINEMENT APPARATUS. Patent dated July 23, 1968. Disclaimer filed Sept. 23, 1971, by the assignee, *Applied Power Industries, Inc.*

Hereby enters this disclaimer to claim 12 of said patent.

3,400,227.—*William P. Lear*, Wichita, Kans., and *Samuel H. Auld*, Bloomfield Hills, Mich. COMBINED RADIO AND MAGNETIC TAPE PLAYER. Patent dated Sept. 3, 1968. Disclaimer filed Nov. 24, 1971, by the assignee, *Gates Learjet Corporation*.

Hereby disclaims the portion of the term of the patent subsequent to Oct. 31, 1984.

3,403,868.—*William P. Lear*, Wichita, Kans. MAGNETIC TAPE CARTRIDGE SYSTEM. Patent dated Oct. 1, 1968. Disclaimer filed Nov. 24, 1971, by the assignee, *Gates Learjet Corporation*.

Hereby disclaims the portion of the term of the patent subsequent to Oct. 31, 1984.

3,418,147.—*David Palmer Fields*, Wilmington, Del. SURFACE TREATING PIGMENTS WITH HYDROUS METAL OXIDES. Patent dated Dec. 24, 1968. Disclaimer filed Sept. 3, 1971, by the assignee, *E. I. du Pont de Nemours and Company*.

Hereby enters this disclaimer to claim 8 of said patent.

3,582,369.—*Henry Nouveau*, Saint Germain-les-Corbeil, Seine-et Oise, France. LININGS FOR STEEL INGOT MOLDS AND FOUNDRY MOLDS. Patent dated June 1, 1971. Disclaimer filed July 15, 1970, by the assignee, *Societe Anonyme Produits Metallurgie Doittau S.A.*

Hereby disclaims the portion of the term of the patent subsequent to Oct. 3, 1984.

Certificates of Correction for the Week of Jan. 25, 1972

3,335,395	3,580,751	3,591,619	3,596,899
3,403,254	3,580,752	3,591,677	3,597,057
3,434,087	3,580,960	3,591,708	3,597,096
3,452,244	3,582,494	3,591,908	3,597,318
3,458,364	3,582,623	3,591,910	3,597,348
3,460,031	3,582,907	3,592,053	3,597,579
3,467,772	3,583,665	3,592,262	3,597,681
3,481,265	3,584,020	3,592,333	3,597,827
3,523,114	3,584,154	3,592,335	3,598,017
3,533,282	3,585,030	3,592,624	3,598,056
3,535,286	3,585,068	3,592,661	3,598,468
3,546,296	3,585,920	3,592,717	3,598,568
3,550,908	3,586,435	3,593,063	3,598,644
3,551,376	3,586,673	3,593,127	3,598,708
3,555,017	3,587,429	3,593,272	3,598,742
3,556,847	3,587,786	3,593,342	3,598,980
3,558,111	3,587,923	3,593,839	3,599,215
3,558,352	3,588,588	3,593,960	3,599,484
3,560,482	3,588,596	3,594,085	3,600,152
3,562,303	3,588,672	3,594,378	3,600,561
3,564,799	3,588,855	3,594,550	3,601,010
3,568,791	3,588,979	3,595,069	3,601,237
3,569,607	3,589,031	3,595,236	3,601,679
3,569,773	3,589,230	3,595,308	3,601,840
3,570,820	3,589,479	3,595,564	3,602,181
3,571,696	3,589,849	3,595,734	3,602,366
3,573,021	3,589,974	3,595,900	3,602,389
3,574,002	3,590,057	3,595,985	3,602,624
3,574,298	3,590,086	3,596,236	3,602,822
3,575,294	3,590,133	3,596,435	3,603,573
3,577,464	3,591,015	3,596,494	3,603,699
3,578,659	3,591,336	3,596,522	3,604,831
3,579,525	3,591,531	3,596,731	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 11, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-04-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-20-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-21-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-18-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-30-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	8-10-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-27-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-01-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-01-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	11-03-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	12-03-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	1-04-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	12-01-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-01-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	2-01-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-04-71

Expiration of patents: The patents within the range of numbers indicated below expire during January 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,698,434 to 2,700,783, inclusive
Plant Patents..... Numbers 1,339 to 1,344, inclusive

REISSUES

JANUARY 25, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,279

DIMER ACID CONTAINING ALKYD RESINOUS COATING COMPOSITIONS AND PROCESS OF PREPARING THE SAME

Ralph E. Layman, Stamford, Conn., assignor to American Cyanamid Company, New York, N.Y.

No Drawing. Original No. 3,158,584, dated Nov. 24, 1964, Ser. No. 74,792, Dec. 9, 1960. Application for reissue July 10, 1970, Ser. No. 53,975

Int. Cl. C08g *17/16;* C09d *3/64*

U.S. Cl. 260—22 D 11 Claims

An alkyd resin composition comprising the esterification reaction product of a phthalic acid, a polyhydric alcohol and a dimer of an ethylenically unsaturated aliphatic monocarboxylic acid having beeween 14 and 22 carbon atoms, wherein said polyhydric alcohol is present at least in part as a glycol in an amount sufficient to constitute at least 65% by weight based on the total weight of polyhydric alcohols present in said reaction product and wherein said dimer acid is present in an amount varying between 10% and 32% by weight based on the total weight of the aforesaid reactants in the composition, said alkyd resin being soluble in an inert organic solvent at room temperature.

PATENTS

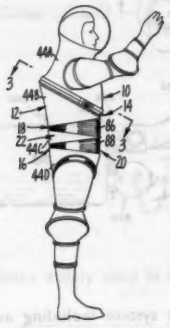
GRANTED JANUARY 25, 1972

GENERAL AND MECHANICAL

3,636,564
SPACE SUIT HAVING IMPROVED WAIST AND TORSO MOVEMENT

Hubert C. Vykukal, Cupertino, Calif., assignor to The United States of America as represented by the National Aeronautics and Space Administration

Filed Mar. 23, 1970, Ser. No. 21,644
Int. Cl. A62b *17/00*
U.S. Cl. 2—2.1 A **5 Claims**

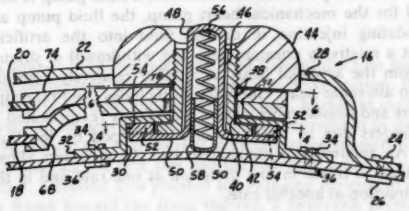


A space suit is provided having improved torso and waist movement. The space suit includes a canted rotary joint near the middle of the torso, said rotary joint being set at an angle of about 30° to horizontal and tilting upwardly from the front. The space suit also preferably includes a double bellows for improved waist action.

3,636,565
UNIVERSAL DUAL VISOR ASSEMBLY FOR HELMETS

August G. Luisada, Waymart, and Joseph A. Cianflone, Carbondale, both of Pa., assignors to Gentex Corporation, New York, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,854
Int. Cl. A42b *3/00*
U.S. Cl. 2—6 **11 Claims**

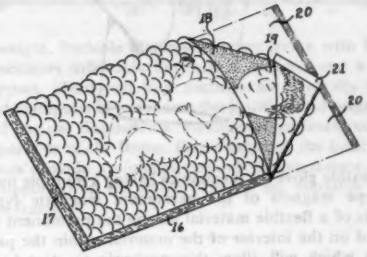


A universal dual visor assembly for helmets in which inner and outer lenses are supported by a pair of hollow shafts rotatably carried by the helmet and provided with bores of noncircular cross section which slidably receive pushbuttons of corresponding noncircular cross section for axial movement between a shaft locking position at which locking elements thereon selectively engage in spaced recesses in the shaft housing to hold the corresponding shaft in a selected position and a release position at which the shaft is free to rotate. One lens is coupled to one of the shafts for rotation therewith while being free to rotate with respect to the other shaft while the other lens is coupled to the other shaft for rotation therewith while being free to rotate with respect to the one shaft.

3,636,566
SWADDLER

James M. Sutherland, The Childrens Hospital Research Foundation, Elland and Bethesda, Cincinnati, Ohio

Filed Feb. 2, 1970, Ser. No. 7,456
Int. Cl. A41d *3/00*
U.S. Cl. 2—69.5 **6 Claims**



A swaddler for babies which is formed of a cellular laminate of transparent plastic sheet material, the sheet material being folded upon itself to form a bag and the material having an integral extension projecting from the opening of the bag, the extension being adapted to be wrapped about the head of a baby lying within the bag to form a hood for the baby.

3,636,567
SHIRT FABRICATION

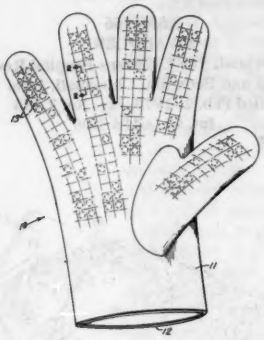
Joseph Benevento, Tuscon, Ariz., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 27, 1970, Ser. No. 14,983
Int. Cl. A41b *1/00*
U.S. Cl. 2—115 **8 Claims**

A shirt with a "built in" collar is provided. The shirt may be prepared from either one or two sections of fabric. In

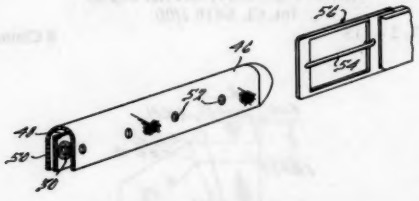
either case the neck collar portion of the fabric is specifically cut so that upon assembly of the shirt a full collar portion thereof may be formed by simply folding back the fabric around edges of the neck opening.

3,636,568
MECHANICS MAGNETIC GLOVE
John P. Stuner, P.O. Box 27, Dover, Idaho
Filed Apr. 1, 1970, Ser. No. 24,526
Int. Cl. A41d *19/00, 13/10*
U.S. Cl. 2—161 **1 Claim**



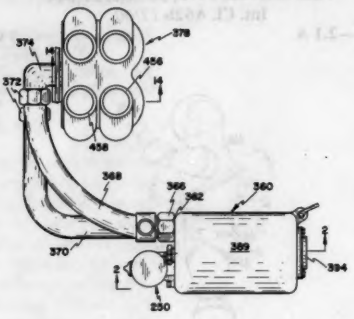
A flexible glove for mechanics having a multiple number of disc-type magnets of the permanent magnetic type. This glove is of a flexible material having the permanent magnets secured on the interior of the material within the palm, and fingers which will allow the mechanic to start bolt, nuts, screws and other fasteners in areas where the fasteners may be easily dropped, the mechanic being prevented from dropping them because of the internal magnets of the glove attracting and holding the fasteners to the glove.

3,636,569
EYELET CONSTRUCTION
Ruth A. Nielson, Seestrasse 5, 8803 Rueschlikon, Schweiz, Switzerland
Filed Mar. 10, 1969, Ser. No. 805,677
Int. Cl. A41f *9/00, 9/02*
U.S. Cl. 2—325 **2 Claims**



An eyelet or buttonhole construction comprising an exterior fabric member having at least one buttonhole slit formed therein; a relatively flexible fabric base reinforcing member disposed interiorly of and in confronting relation to the exterior member and having at least one buttonhole slit formed therein and aligned with the slit in the exterior member, and an adhesive material interposed between the confronting surfaces of the exterior and reinforcing members, whereby the reinforcing member is adapted for contiguous adherence to the exterior member, particularly in the area directly adjacent the slit, to prevent the fibers or threads of the exterior member from fraying upon insertion into and removal of an associated button or the like from the slit.

3,636,570
MECHANICAL HEART SYSTEM
Jay P. Nielson, 3490 South 3685 E, Salt Lake City, Utah
Filed Sept. 24, 1969, Ser. No. 860,546
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **4 Claims**

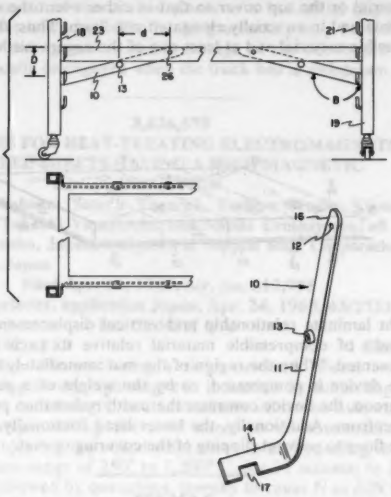


A mechanical heart system including an artificial heart having a rigid exterior casing which is partitioned into two halves, each half being divided into chambers by a flexible diaphragm which collapses to pump blood out of the artificial heart when subjected to fluid pressure and which expands to withdraw blood into the artificial heart when the fluid pressure is removed therefrom. A mechanical driving pump forces driving fluid into and withdraws driving fluid from the artificial heart to control the operation of the diaphragm, the pump (a) forcing driving fluid into the artificial heart at a rate which is greater than the withdrawal of driving fluid from the artificial heart and (b) providing a more uniform rate of fluid flow between the pump and the artificial heart and modulating the transition between injection and withdrawal of driving fluid from the artificial heart. A pump regulator is connected to the power input of the mechanical pump, the regulator responding to the breathing rate of the user of the system to control the power input to the mechanical pump whereby the breathing rate of the user will determine the rate at which blood pumps from the artificial heart. In an alternative preferred embodiment, a fluid pump is substituted for the mechanical heart pump, the fluid pump accommodating injection of driving fluid into the artificial heart at a relatively constant rate and withdrawal of driving fluid from the artificial heart at another relatively constant rate. An alternate heart embodiment includes fluid-receiving cylinders and displaceable pistons alternately reciprocated in the cylinders due to fluid pressure developed by the fluid pump. An accumulator associated with the cylinders allows the pistons to travel in one direction at one rate and in the other direction at another rate.

3,636,571
CRIB STABILIZER
Richard S. Winer, 32 Emerson Way, Sudbury, Mass.
Filed May 15, 1970, Ser. No. 37,548
Int. Cl. A47d *7/03, 9/00*
U.S. Cl. 5—11 **4 Claims**

The invention relates to a stabilizing means for cribs which attaches to the spring and moves with the spring as the height of the spring is adjusted. The brace is L-shaped and is

secured to the spring at one end. The brace also contains a lateral member at the other end which fits into standard



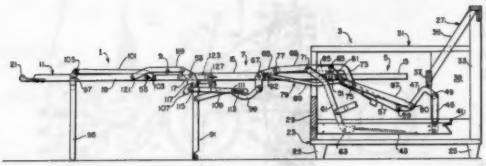
height-adjusting hooks widely used in the manufacturing of cribs.

3,636,572

SOFA BED FOLDING FIXTURE

Paul W. Eakins, St. Louis, Mo., assignor to Foster Brothers Manufacturing Company, St. Louis, Mo.

Filed June 4, 1970, Ser. No. 43,340
Int. Cl. A47c 17/14
U.S. Cl. 5—13 6 Claims



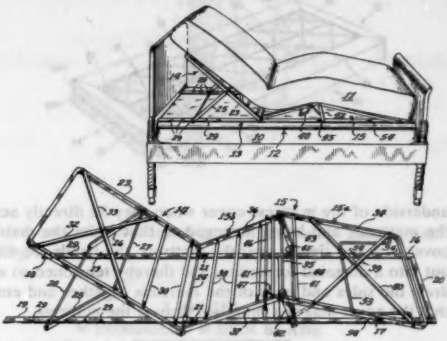
A four-section rise-over sofa bed fixture, the four sections being designated the head section, the body section, the intermediate section, and the foot section, having at each side thereof a first arm pivoted for swinging movement in the sofa frame toward the rear thereof, a head section support link interconnecting the first arm and the rearward end of the body section, a second arm pivoted for swinging movement in the sofa frame toward the front thereof, a bellcrank pivoted on the side of the body section, a lever pivoted intermediate its ends at the upper end of the second arm and having its rear and front ends connected, respectively, to the head section support link and one end of the bellcrank, a folding leg at the outer end of the body section, a link connecting the other end of the bellcrank and the folding leg, and a linkage interconnecting the first arm and the bellcrank comprising a crank arm pivoted on the side of the body section, a link interconnecting the first arm and the crank arm, and a link interconnecting the crank arm and the bellcrank.

3,636,573

FOLDABLE MATTRESS SUPPORT

Fred H. Bartz, Milwaukee, Wis., assignor to Con-Tex Corporation, Milwaukee, Wis.

Filed Jan. 29, 1970, Ser. No. 6,909
Int. Cl. A61g 7/00; A47c 22/00
U.S. Cl. 5—69 11 Claims



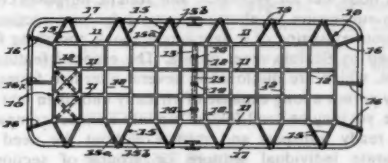
A lightweight, foldable mattress support frame with head and foot sections insertable between a mattress and a box spring support. Head and foot sections are pivotally connected and manipulated between a flat position and positions at selected angular dispositions. Flexible straps interconnect marginal portions of the frame. Pivots between the head and foot sections provide a minimal amount of disturbance of a mattress supported on the frame between the marginal portions of the frame.

3,636,574

SUPPORTING MEANS FOR A MATTRESS, CUSHION AND THE LIKE

Hyman Kramer, 50 Carter Ave., Stamford, Conn.

Filed Dec. 22, 1969, Ser. No. 887,196
Int. Cl. A47c 7/02, 27/14
U.S. Cl. 5—186 4 Claims



A mattress or cushion support comprising an injection-molded plastic mat or netlike fabric provided along its side and end edges with integral tie means for speedily yet effectively connecting same to the frame of a bed, folding cot, chair, chaise longue and the like. The plastic mat may be formed as a one-piece grid having length and width such that it provides the complete support, or it may be formed in plural, i.e., two half-length, sections which are secured together along a transverse meeting line (or lines) as by metal clips.

3,636,575

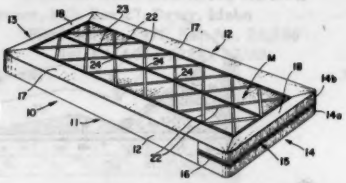
COVER FOR UPHOLSTERED FURNITURE

Imre Jack Smith, 283 Hillhurst Blvd., Toronto, Ontario, Canada

Filed Aug. 24, 1970, Ser. No. 66,448
Int. Cl. A47g 9/00
U.S. Cl. 5—334 7 Claims

A snug-fitting mattress cover, tailored to fit the dimensions of the mattress, and having an opening at one end through

which the mattress can be inserted, and being opened along substantially the entire extent of its underside, the mattress cover being tensioned across and along its open underside by means of a system of intersecting diagonal bands or tapes or strips adapted to provide an increased dimension across the



underside of the mattress cover when they lie directly across the mattress, and being arranged so that when the mattress cover is drawn tightly over the mattress, the bands are drawn out into a diagonal formation, and thereby tensioned so as to draw the sides and ends of the mattress together and ensure that the cover makes a snugtight fit over the mattress.

3,636,576

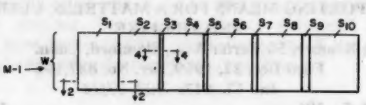
ROLL-FOLD FLOOR MAT FOR GYMNASTIC AND ATHLETIC PURPOSES

George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation, Cedar Rapids, Iowa

Continuation of application Ser. No. 754,255, Aug. 21, 1968, now abandoned. This application Sept. 24, 1970, Ser. No. 75,241

Int. Cl. A47g 9/00

U.S. Cl. 5—344 **10 Claims**



A floor mat for gymnastic and athletic purposes composed of a succession of abutting rectangular mat sections, each section consisting of a lightweight shock absorbing filler enclosed by flexible sheet covers. The especial feature of the mats, which are disclosed in several alternate forms, is that they permit a long expanse of virtually unbroken mat top surface, yet may be "roll-folded" up into a single, compact stack for ready transport and storage without the need first to separate individual sections or groups of sections. The foregoing is accomplished by making the lengths of successive mat sections a function of their thickness and by joining the abutting section by their top covers only.

3,636,577

COMPRESSIBLE COVERINGS FOR ATHLETIC AND GYMNASTIC USE

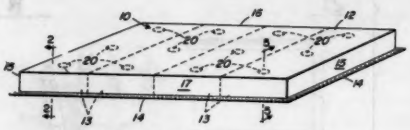
George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation, Cedar Rapids, Iowa

Filed July 29, 1968, Ser. No. 763,454

Int. Cl. A47g 9/00

U.S. Cl. 5—344 **22 Claims**

A gymnastic or athletic floor covering or mat employs compressible or shock absorbing material secured to sheet material to form a laminate by fastening means which present little or no protrusion upon compression of the shock absorbing material. The invention has a particular application in the construction of gymnastic mats employing adjacent blocks of compressible material and flexible sheet covers. The fastening means in its preferred form consists of an integral, elastomeric member having a shank provided with headed ends. The length of the shank is such that upon insertion of the member through the mat, the underside of one of the heads engages the outer face of the bottom cover and that of the other head the upper face of either the compressible material or the top cover so that in either event the shank is maintained in an axially elongated condition. Thus, the compressible material and at least one of the covers are held in a



tight laminate relationship and vertical displacement of the blocks of compressible material relative to each other is prevented. When the region of the mat immediately adjacent the device is compressed, as by the weight of a performer thereon, the device contracts therewith rather than protrudes therefrom. Additionally, the lower head frictionally engages the floor to prevent slipping of the covering or mat.

3,636,578

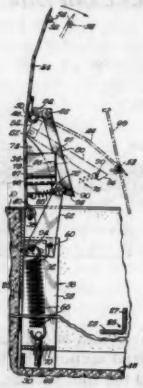
SPRING COUNTERBALANCED COMPACT DOCKBOARD

Donald P. Dieter, Springfield, Tenn., assignor to Overhead Door Corporation, Dallas, Tex.

Filed June 20, 1969, Ser. No. 834,987

Int. Cl. B65g 11/00

U.S. Cl. 14—71 **11 Claims**



A folding dockboard includes a deck plate hingedly mounted to a loading dock and a lip plate which is hingedly mounted to the deck plate and adapted to be positioned on the bed of a lading carrying vehicle. The lip plate is rotatable from a position in which the lip plate is positioned at a substantial angle to the deck plate to a position in which the deck and lip plates lie in substantially the same plane and counterbalancing springs exert a force on the deck plate in a direction so as to urge the deck plate toward a substantially upright position. A latching assembly rigidly latches the deck and lip plates to each other when the lip plate is positioned in the same plane as the deck plate. The counterbalancing

springs maintain the latched deck and lip plates in the substantially upright disposition, but the force exerted by the springs is overcome by the extended lip plate when the latched plates are tilted from their upright disposition, causing movement of the latched plates to a horizontal disposition on the truck bed. The latching assembly may be either manually disengaged to enable storage of the dockboard or automatically disengaged when the truck bed is withdrawn.

3,636,579

PROCESS FOR HEAT-TREATING ELECTROMAGNETIC STEEL SHEETS HAVING A HIGH MAGNETIC INDUCTION

Akiri Sakakura; Satoru Taguchi; Toshiya Wada; Kiyoshi Ueno; Takaaki Yamamoto, and Nabuo Urushiyama, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 21, 1969, Ser. No. 817,795
Claims priority, application Japan, Apr. 24, 1968, 43/27511
Int. Cl. H01f *1/16*
U.S. Cl. 148—111 **1 Claim**

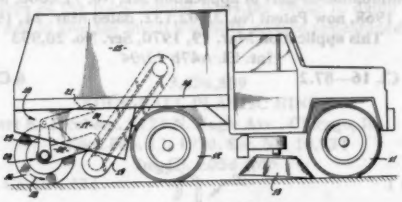
A method for producing a single-oriented silicon steel sheet having a very high magnetic induction by subjecting a steel sheet containing C and acid-soluble Al to the following process steps; rolling the steel sheet to an intermediate gauge, subjecting the rolled steel sheet to an annealing in a temperature range of 750° to 1,200° C. for 30 seconds to 30 minutes followed by quenching, thereby to cause N as AlN to precipitate in the steel sheet in an amount of at least 0.0005 percent and then cold-rolling the quenched steel sheet.

3,636,580

ROAD SWEEPER HYDRAULIC BROOM DRIVE AND MOUNTING

Rodney L. Woodworth, Claremont, Calif., assignor to Wayne Manufacturing Company, Pomona, Calif.

Filed Dec. 10, 1969, Ser. No. 883,768
Int. Cl. E01h *1/04*
U.S. Cl. 15—84 **6 Claims**



A road sweeper pickup broom is suspended by a parallel linkage supporting a broom driving hydraulic motor having a broom drive rotor and a housing fixed to a support component of the linkage.

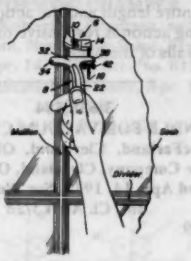
3,636,581

WINDOW SASH PAINTBRUSH

Willard V. Zeman, 10430 Albemarle Road, Lot #30, Charlotte, N.C.

Filed Apr. 13, 1970, Ser. No. 27,544
Int. Cl. A46b *17/00*
U.S. Cl. 15—166 **4 Claims**

A brush for painting mullions and component parts of a sash frame which, does not require a steady hand and which, when properly adjusted and used, prevents smearing of unwanted paint on the panes of glass. A brush of requisite size and shape having a screw-threaded shank at the headed end. This shank constitutes a part of an adapter and is adjustably



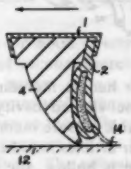
mounted on a simple easy-to-control steadying, guiding and handling unit.

3,636,582

WINDSHIELD WIPER BLADE

Walton Reid Wright, Raleigh, N.C., assignor to Unitek, Ltd., Raleigh, N.C.

Filed July 10, 1970, Ser. No. 53,731
Int. Cl. B60s *1/02*
U.S. Cl. 15—250.03 **11 Claims**



A windshield wiper blade provided with a longitudinal porous sack extending parallel to and closely adjacent the wiper blade, said sack containing a soluble cleansing agent so that when the windshield is wetted the detergent is dissolved and released from the sack through the assistance of the flexing action of the wiper blade and the solution applied to the windshield to dissolve and/or remove road film, grime, mud and the like.

3,636,583

SQUEEGEE BLADE

Ian K. Rosen, 440 Mitzi St., North Muskegon, Mich.

Filed Jan. 26, 1970, Ser. No. 5,690
Int. Cl. B60s *1/32, 1/28*
U.S. Cl. 15—250.36 **7 Claims**

A new rubber or rubberlike squeegee blade for windshield wipers and the like and including hinged sidewalls in the

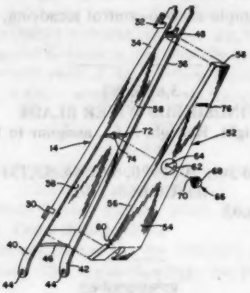
elongate body allowing flip-flop controlled action of the wiping lip and where the movement of the sidewalls is restricted by suitable buttresses. The blade has a uniform cross section throughout its entire length and the action of the blade at any point in its wiping action is responsive to a parallelogram motion of the sidewalls of the blade.

3,636,584

HANDLE FOR VACUUM CLEANER

Charles H. MacFarland, Cleveland, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Apr. 14, 1970, Ser. No. 28,437
Int. Cl. A47l *5/28*
U.S. Cl. 15—339 **8 Claims**



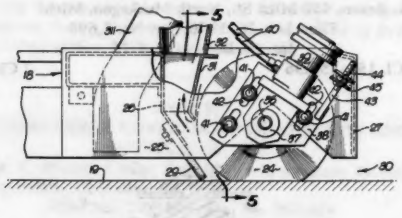
A vacuum cleaner handle including an intermediate portion having a channel-shaped cavity therein. The cavity is covered by a removable closure member having a slot therein so that coins or other articles may be deposited in the cavity. Although the handle is hollow, the intermediate portion of the handle and its closure member present an attractive solid appearance.

3,636,585

RUNWAY OR STREET SWEEPER

Gregory J. Larsen, Claremont, Calif., assignor to Wayne Manufacturing Company, Pomona, Calif.

Filed Nov. 20, 1969, Ser. No. 878,325
Int. Cl. E01h *1/08*
U.S. Cl. 15—340 **7 Claims**



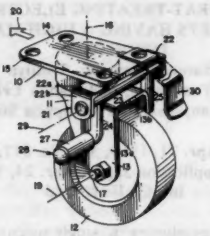
In distinction to a conventional powered road sweeper having its pickup broom operating in a chamber under conditions such that the broom tends to create a slipstream carry over of some of the sweepings, this tendency is minimized in the present structure employing an open bottom broom-containing suction hood beneath the sweeper vehicle and having an open top through which airflow is induced into the broom chamber, nullifying the stated slipstream effect and otherwise simplifying the construction and maintenance of the broom chamber and related parts.

3,636,586

CASTER AND SWIVEL LOCK ASSEMBLY

Howard N. Bollinger, and Leslie R. Inglis, both of Cincinnati, Ohio, assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 11, 1969, Ser. No. 884,182
Int. Cl. B60b *33/00*
U.S. Cl. 16—35 **6 Claims**



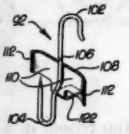
A self-aligning swivel caster for use on carts and the like, the caster being equipped with a releasable locking member capable of selectively locking the caster against swivel movement. The locking member is gravity actuated and may be latched in an inoperative position as desired. The structural relationship of the caster and locking member are such that automatic camming and subsequent actuation of the locking member occur as the caster wheel is swiveled from an unlocked position into a position in which it is capable of being locked.

3,636,587

DRAPERY HOOK

Mark H. Hager, Los Angeles, and Clarence R. Adams, Glendale, both of Calif., assignors to The Slick Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 713,606, Mar. 18, 1968, now Patent No. 3,502,132, dated Mar. 24, 1970. This application Mar. 19, 1970, Ser. No. 20,993
Int. Cl. A47h *13/04*
U.S. Cl. 16—87.2 **6 Claims**



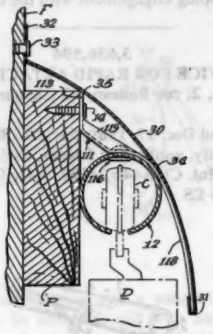
A drapery hook having a rearwardly and downwardly facing, upper hook means engageable with a drapery support and a forwardly and upwardly facing, lower hook means connected to the upper hook means and engageable with a drape. A guide means connected to the hook means is slidable along a forwardly facing portion of the drapery support and includes transversely spaced guide tabs projecting transversely outwardly in opposite directions and terminating in transversely outwardly and forwardly projecting ends. The guide means may also include a rearwardly extending retainer tab engageable with a downwardly facing portion of the drapery support to prevent disengagement of the upper hook means therefrom.

3,636,588

SLIDING DOOR TRACK STRUCTURE

Robert G. Ferris, deceased, late of Harvard, Ill., assignor to Starline, Inc., Harvard, Ill.

Filed Nov. 14, 1969, Ser. No. 876,875
Int. Cl. A47h *15/00*
U.S. Cl. 16—94 8 Claims



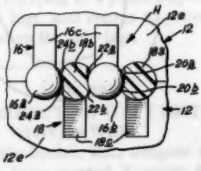
A split-tubular track structure to receive carriage means for suspending sliding doors from a wall of a building and brackets for mounting the track on a building wall above a door opening. Preferably the brackets have fastening flanges parts of which overlie a horizontal surface of the building wall so as to be mounted by nails driven through the horizontal surface, track flanges on the brackets have depending headed studs which slidably engage a line of keyhole slots in the upper part of the track for quick mounting of the track on the brackets, and means are provided for preventing the track from moving relative to the brackets. For outdoor use the bracket track flanges extend downwardly and outwardly from the track, and a continuous shield has its upper edge portion secured to the building wall and its lower edge portion folded around the outer ends of the track flanges. Firm contact between an intermediate portion of the shield and the tops of the track flanges bows the shield to damp vibration and to give the shield a smooth surface appearance.

3,636,589

FOUR-BALL PLASTIC HINGE

Robert K. Jacobsen, 3121 N. Nagle Ave., Chicago, Ill.

Filed Feb. 12, 1970, Ser. No. 10,931
Int. Cl. E05d *1/06*
U.S. Cl. 16—171 1 Claim



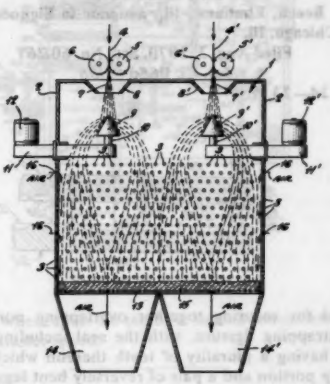
An improved and more readily molded four-ball hinge for box sections is provided by arranging three elongated parallel grooves in one of the two sets of two balls, with one end of each groove being closed off by an abutment, and with one groove opening in a direction opposite to the opening direction of the other two grooves. All of the grooves are provided inwardly of the outermost portions of the snapped-together hinge, and the balls of the hinge have substantially the same nominal diameter.

3,636,590

MEANS FOR PREVENTING THE ADHESION OF MINERAL FIBERS TO THE WALLS THEREOF OF A FORMING CHAMBER

Erwin Jaeger, zum Kalverhof, Germany, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

Filed Apr. 14, 1969, Ser. No. 815,686
Claims priority, application Germany, Apr. 16, 1968, P 17 60 261.8
Int. Cl. D01g *1/00*
U.S. Cl. 19—.56 15 Claims



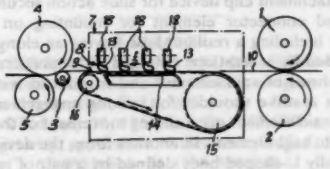
A forming chamber or hood overlying an air-permeable support with a source of vacuum therebelow, which creates a downwardly directed stream of gas in the chamber into which is dropped electrostatically charged mineral fibers having a tendency to adhere to the walls of the chamber as they are distributed on the support for the formation of a felt or mat of the deposited fibers. The adhesion of the fibers to the chamber walls is prevented by the provision of a plurality of openings in the chamber walls of predetermined diameter, disposition and spacing relative to a slight underpressure maintained in the interior of the chamber, through which openings are sucked in a plurality of slight air currents from the outside to the inside of the chamber walls, whereat they are deflected in a downward direction by the gas stream to form air cushions along the walls on which the fibers slide downwardly without touching the walls of the chamber and without the generation of vortices therein.

3,636,591

DRAFTING DEVICE FOR TEXTILE MACHINES

Jean Frederic Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, Guebwiller, France

Filed Nov. 5, 1969, Ser. No. 874,136
Claims priority, application France, Nov. 28, 1968, 175735
Int. Cl. D01h *5/00*
U.S. Cl. 19—236 13 Claims



The present invention relates to a drafting machine for the preparation and spinning of natural or manmade textile fibers and more particularly to the devices for controlling said fibers.

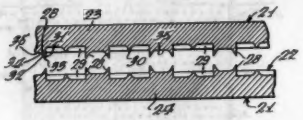
A device according to the invention comprises, between feed cylinders and drafting cylinders, two fields of control elements movable in the sense of forward movement of the fibrous material to be drafted between the two fields. A least one of said fields is constituted by bars with flexible lips each formed from a transverse strip of material presenting a degree of flexibility such as rubber, leather or an elastomer folded back on itself in the form of a loop called upon to exert a degree of pressure against the said fibrous material.

3,636,592

TOOTHED SEAL

John R. Beach, Elmhurst, Ill., assignor to Signode Corporation, Chicago, Ill.

Filed Aug. 3, 1970, Ser. No. 60,267
Int. Cl. B65d *63/06*
U.S. Cl. 24—23 W 8 Claims



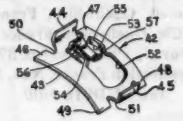
A seal for securing together overlapping portions of a plastic strapping ligature, with the seal including a central portion having a plurality of teeth thereon which bite into one strap portion and a pair of reversely bent legs each having a plurality of teeth thereon which bite into the other strap portion. The teeth are arranged in a plurality of rows or columns in the central portion and each of the legs of the seal, and the teeth are formed by displacing material outwardly from the strap engaging surface of the seal, so that the outer surface of the seal remains generally smooth and nonperforated. The teeth all have a similar configuration including an upright strap engaging surface, with a plurality of the teeth on the central portion and on each leg having their upright surfaces facing in opposite directions.

3,636,593

ATTACHMENT CLIP DEVICE

Albert T. Buttriss, Westlake, and Clarence R. Van Niel, North Olmsted, both of Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Jan. 3, 1969, Ser. No. 788,737
Int. Cl. A44b *21/00*; E04f *19/02*
U.S. Cl. 24—73 MF 11 Claims



An attachment clip device for slide action securement with a headed connector element for mounting on a support member including a resilient base having an elongated opening defined by at least one enlarged width portion for receiving the head of said element and a reduced width portion having a seatlike shoulder for locking engagement with the head of said element upon sliding movement of the base with respect to said element. In another form, the device includes a generally U-shaped body defined by a pair of resilient legs extending outwardly from a bight portion with one of the legs providing a base having an opening for receiving said connector element therethrough, and the other of said legs having the elongated opening with said enlarged and reduced width portions for slidable interlocking engagement with said connector element. In another form, the base of the device includes a plurality of outwardly extending peripherally spaced resilient finger members adjacent the opening therein for push action interlocking engagement with said connector element, or a pluglike member depending downwardly from said base for push action interlocking engagement interiorly of said connector element. In another form, the device has a generally looplike body including inturned apertured ends for scissorslike gripping engagement with the connector element.

3,636,594

DEVICE FOR RAPID ATTACHMENT

Bernard Faivre, 2, rue Boileau, 92 Clamart (Haute-de-Seine), France

Filed Dec. 17, 1969, Ser. No. 885,724
Claims priority, application France, Dec. 17, 1968, 3595
Int. Cl. A44b *21/00*; A43c *9/00*
U.S. Cl. 24—73 ES 11 Claims

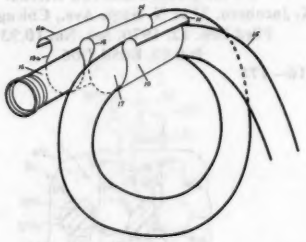
A quick-action fastener including a hollow body provided with a longitudinal hole, a lateral window and an elongate slot all communicating with each other, a flexible element thicker, when unstretched, than said slot but thinner than the window, and anchoring means for anchoring one end of the flexible element within the body.

3,636,595

COILING CLIP FOR COILING AND STORING LINEAR FLEXIBLE MATERIAL

David D. Wines, 25545 Tweed Drive, Franklin, Mich.

Filed May 22, 1970, Ser. No. 39,591
Int. Cl. A44b *21/00*
U.S. Cl. 24—81 CC 4 Claims



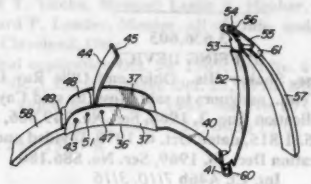
A coiling clip for coiling and storing linear flexible material, such as garden hoses, extension cords, ropes and the like. The coiling clip comprises at least a pair of U-shaped sockets which are made from suitable material having a spring or flexible quality, as for example, flat spring wire. The coil is used by pressing one end of the linear material to be coiled into one of the sockets and then forming a first loop and pressing the other end of the first loop into the socket. The user then moves the initial loop through his hands to continue coiling the entire length of the linear material.

3,636,596

BUCKLE CONSTRUCTION FOR A WRISTWATCH BRACELET

Yoshihiro Iizuka, Ageo-shi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed July 7, 1969, Ser. No. 839,470
Int. Cl. A44b *11/12*
U.S. Cl. 24—191 6 Claims



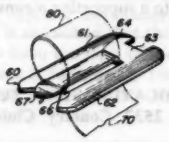
Buckle construction for use with a watch bracelet which can be designed to be compact and with an excellent appearance and is effective to prevent accidental unlocking of the buckle worn on a person's wrist.

3,636,597

WRAPPING TAPE FASTENER

Thomas Barnickel, 265 Main St., Ridgefield Park, N.J.

Original application July 27, 1967, Ser. No. 660,683, now Patent No. 3,420,159, dated Jan. 7, 1969. Divided and this application Jan. 6, 1969, Ser. No. 789,153
Int. Cl. A46b *11/00*
U.S. Cl. 24—198 3 Claims



A wrapping tape fastener for securing together at least two courses of engaged tape in the form of a loop having a pair of spaced-apart side legs joined at one end of each leg by a crossmember and a central leg formed on the crossmember extending in the direction of and generally intermediate the side legs, the central leg lying in a plane displaced away from the plane of the side legs, and means to prevent the central leg from passing between the side legs.

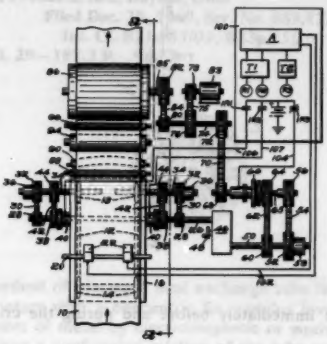
3,636,598

METHOD FOR CORRECTING WEFT DISTORTIONS IN WOVEN WEBS

John H. Hannaway, Pawtucket, R.I., assignor to Mount Hope Machine Company, Incorporated, Taunton, Mass.

Filed Nov. 6, 1969, Ser. No. 874,503
Int. Cl. D06h *3/12*
U.S. Cl. 26—51.4 3 Claims

Bow distortions of the weft threads of woven webs are removed by normally operating a tenter frame at a slightly faster speed than a roll feed drawing the web forwardly from the tenter, thereby intentionally inducing a lagging bow in the web. Bow detection means are connected to momentarily slow the speed of the tenter to less than that of the roll feed when the lagging bow attains an acceptable maximum, allowing the weft threads to return to a straight configuration and eventually toward a leading bow of maximum acceptable magnitude, whereupon the tenter is caused to resume its normal slightly faster speed.

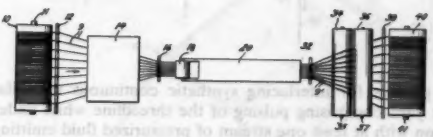


3,636,599

METHOD AND APPARATUS FOR STRAND CRIMPING

Robert K. Stanley, Media, Pa., assignor to Techniservice Corporation

Continuation-in-part of application Ser. No. 718,737, Apr. 14, 1968, now Patent No. 3,553,802, dated Jan. 12, 1971. This application Sept. 4, 1970, Ser. No. 69,742
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 10 Claims



Multiple-end stuffer-crimping of textile strands side-by-side in a temporarily confining chamber is improved by spacing the crimped strands laterally from one another upon their withdrawal from the chamber exit and deflecting them intermittently perpendicular to the plane of their lateral spacing and longitudinal travel.

3,636,600

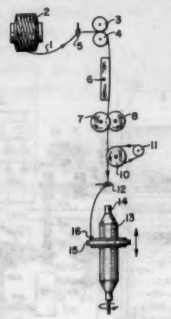
APPARATUS FOR CRIMPING AND DRAWING YARN

Johan J. Mertens, Rozendaal, Netherlands, assignor to American Enka Corporation, Enka, N.C.

Filed July 30, 1968, Ser. No. 748,690
Claims priority, application Netherlands, Aug. 4, 1967, 6710832; Feb. 14, 1968, 6802063
Int. Cl. D02g *1/14*
U.S. Cl. 28—1.8 10 Claims

A continuous one-pass apparatus for drawing and crimping synthetic polymer yarn. Heated, undrawn yarn is forwarded

to a crimper at a predetermined, critical angle of contact with the crimping members thereof in order that the yarn be



evenly drawn immediately before and during the crimping process.

3,636,601

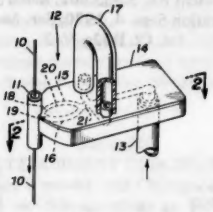
REGULARLY TANGLED COMPACT YARN PROCESS

Paul D. Barlow, and John L. Marshall, Jr., both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 720,798, Apr. 12, 1968, now Patent No. 3,478,398, which is a division of application Ser. No. 670,137, Sept. 25, 1967, now Patent No. 3,422,516. This application June 23, 1969, Ser. No. 835,595

Int. Cl. D02g *1/16*

U.S. Cl. 28—72.12 **3 Claims**



A process for interlacing synthetic continuous multifilament yarn comprising pulsing of the threadline while under tension with at least one stream of pressurized fluid emitting through a Coanda-effect fluidic oscillator.

3,636,602

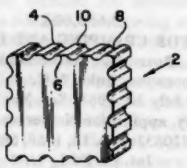
CUTTING TOOLS

Frank Owen, 41 Dalton Green Lane, Dalton Huddersfield, Yorkshire, England

Filed July 11, 1969, Ser. No. 841,091

Int. Cl. B26d *1/00*

U.S. Cl. 29—95 **7 Claims**



A tungsten carbide blade for hard stock cutting tools has three or more contiguous cutting edge faces of conventional thickness such that each cutting edge face has two stock-engaging cutting edges, only one of which performs a cutting function at a time. When one edge becomes blunted the blade is reseated in its holder to present the other cutting edge to the work. Blade shock and load is reduced by constituting each cutting face as a series of lands spaced apart by intervening recesses. When two blades are placed side by side with one reversed relative to the other, the lands of one blade are in complemental registry with the recesses in the other blade, thus presenting to the work a continuous but staggered line of cutting edge lands.

3,636,603

BUFFING DEVICE

Theron V. Moss, Shaker Hts., Ohio, and Ollie Ray Caylor, McDonald, Tenn., assignors to said Moss, by said Caylor

Original application Aug. 2, 1968, Ser. No. 749,806, now Patent No. 3,531,815, dated Oct. 6, 1970. Divided and this application Dec. 18, 1969, Ser. No. 886,180

Int. Cl. A46b *7/10, 3/16*

U.S. Cl. 29—120 **10 Claims**

A buffing device formed from a longitudinally extending wrapping of yarn which is collapsed substantially centrally along its longitudinal axis to form looped yarns on opposite sides of the collapsed section. The wrapping is attached to a support which may have means to mount the buffing device on an arbor or the like. The buffing device is made by forming such a longitudinally extending wrapping, collapsing the same longitudinally thereof to form the looped yarns and attaching the wrapping to a supporting means.

3,636,604

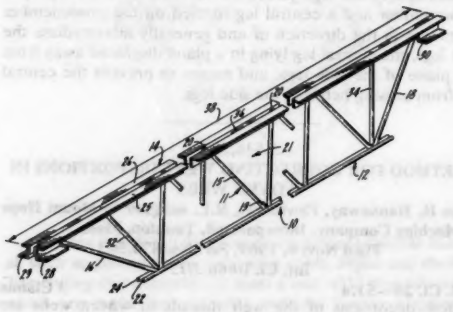
SYSTEM FOR FABRICATING STRUCTURAL MEMBERS

Robert M. Gooder, 2537 Country Club Drive, Olympia Fields, Ill.

Filed Feb. 11, 1970, Ser. No. 10,560

Int. Cl. B23p *17/00, 19/00*

U.S. Cl. 29—155 R **13 Claims**



A system for making joists including the steps of forming a zigzag-shaped web midsection and opposite ends adapted to fit together to provide a continuous joist web of predetermined depth and length, forming a bottom chord to extend

between the opposite ends of the bottom of the web, assembling said web and bottom chord, forming a top chord, mounting shoes and plugs on the top chord, aligning the top chord with the assembled web and bottom chord, tacking an end of the web and the top chord which are in registry to maintain the alignment, and completing connection of the top chord and web to form a finished joist.

3,636,605

METHOD OF MAKING FORGED VALVES FROM CAST SLUGS

Edward T. Vitcha, Mentor; Leslie A. Hooker, Kirtland, and Richard P. Lauder, Mentor, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

Original application Oct. 24, 1967, Ser. No. 677,554, now Patent No. 3,536,053, dated Oct. 27, 1970. Divided and this application Oct. 1, 1969, Ser. No. 871,070

Int. Cl. B21k *1/20;* **B23p** *13/00*

U.S. Cl. 29—156.7 R **3 Claims**

Method for making poppet valves wherein the valve alloy is cast into the form of a slug having a chamfered end portion under conditions such that a columnar structure exists in the portion of the slug opposite the chamfered end portion, and thereafter the slug is shaped so that the chamfered end portion is extended to form the stem of the valve while the opposite end of the slug is formed into the head portion of the valve while retaining the as-cast structure in the head portion.

3,636,606

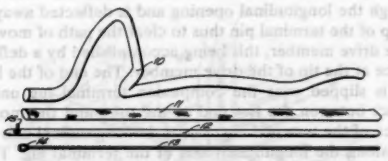
METHOD OF FORMING AND INSTALLING AUTOMOBILE TAILPIPE

Richard L. Doak, Drawer D, Stroud, Okla.

Filed July 14, 1969, Ser. No. 841,350

Int. Cl. B21d *53/00*

U.S. Cl. 29—157.3 **9 Claims**



A tailpipe formed in situ and a method of forming and installing an automobile tailpipe wherein an inflatable tube is placed within a fiberglass hose, the hose is draped into a proper position within an automobile, the tube is inflated to expand the fiberglass hose, a thermosetting or chemical setting resin or a refractory composition is painted or sprayed onto the fiberglass hose, the coating material is hardened to form a rigid fiberglass tailpipe, and the tube is then deflated and withdrawn.

3,636,607

METHOD OF MAKING A HEAT EXCHANGE TUBE

Samuel J. DeMarco, Findlay, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Dec. 30, 1969, Ser. No. 889,123

Int. Cl. B21d *53/02;* **B23p** *15/26*

U.S. Cl. 29—157.3 R **9 Claims**

A method of placing a heat exchange tube into compressive contact with a concentric fin annulus involving a displacement of metal by electromagnetic or equivalent forces to achieve a conforming relation of the tube to the contact tube surface in a manner providing minimal contact resistance to heat flow.

3,636,608

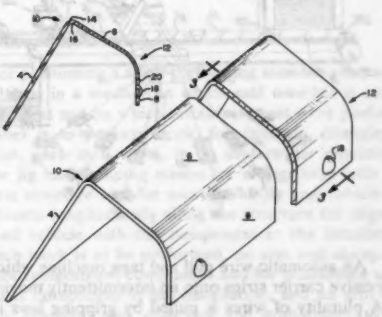
CONTAINER PROTECTIVE EDGE COMPONENT

James K. Thompson, Kansas City, Mo., assignor to Phillips Petroleum Company

Filed Dec. 5, 1969, Ser. No. 882,494

Int. Cl. B65d *25/00, 67/00*

U.S. Cl. 29—183.5 **5 Claims**



A metal blank is contoured for attachment to a substantially cylindrical container edge and the forming of a protective covering on said container edge.

3,636,609

TURBINE BLADE POSITIONING AND GAGING FIXTURE

Frederick J. Stahl, Hawthorne, N.J., assignor to Curtiss-Wright Corporation

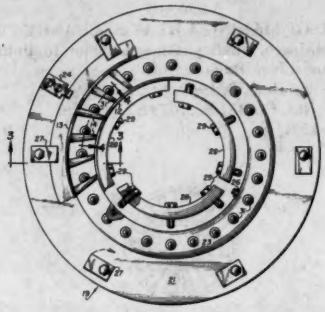
Filed Mar. 14, 1969, Ser. No. 807,360

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 J **6 Claims**

A jig and gaging fixture providing determination of ac-

ceptable and nonacceptable turbine blades, particularly nozzle vanes, and precision positioning of the same between a pair of concentric shrouds in a single operation.

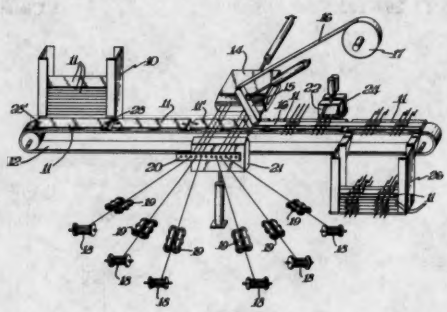


3,636,610

WIRE PULL AND TAPE MACHINE

Sidney B. Williams, Cedarburg, and Martin E. Baumann, West Bend, both of Wis., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jan. 29, 1970, Ser. No. 6,871
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 **5 Claims**



An automatic wire pull and tape machine which loads successive carrier strips onto an intermittently moving conveyor. A plurality of wires is pulled by gripping jaws into position over the carrier strip, the wires are taped to the carrier strip and cut to uniform length during a stationary period of the conveyor. Selected of the taped wires are offset by forming dies and all the wires are trimmed to a uniform length at another stationary period of the conveyor. The carrier strips are then moved from the conveyor to a receptacle.

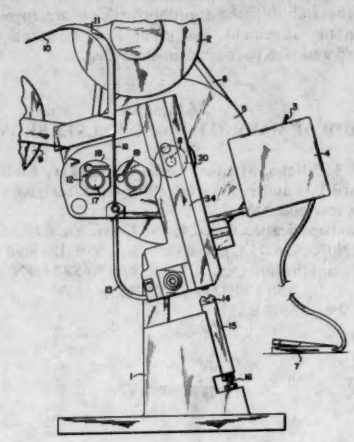
3,636,611

APPARATUS FOR SPLICING WIRES

Irving W. Rosenbaum, Jackson Heights, N.Y., assignor to General Staple Co., New York, N.Y.

Continuation-in-part of application Ser. No. 554,129, May 31, 1966, now abandoned. This application Mar. 26, 1969, Ser. No. 810,759
Int. Cl. H01t *5/10*
U.S. Cl. 29—203 D **16 Claims**

A semiautomatic machine which cuts flat metal strip or wire transversely into blanks, bends the blanks into C-shaped connectors, and clinches the connectors about wires inserted in a die for conductively connecting the wires. Wires as small as 0.001 inch can be spliced effectively. The operator's intervention is limited to insertion of the wires into the die, and the closing of a switch for each splice to be made.

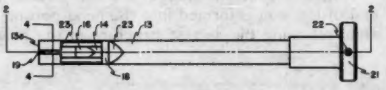


3,636,612

TOOL FOR STAKING A TERMINAL PIN TO A TERMINAL LUG

George Suprun, Lorain, Ohio, assignor to Lorain Products Corporation

Filed Apr. 9, 1970, Ser. No. 26,847
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 D **6 Claims**



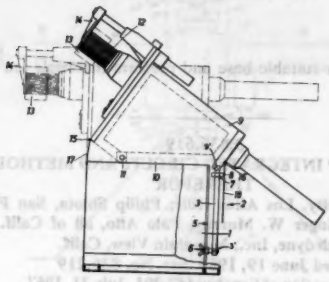
A tool for fastening a wire-bearing terminal pin to terminal lug. A drive member is slidably mounted in a tube having a longitudinal opening in the tube wall at one end thereof. A terminal pin having a wire crimped thereto is pushed into the end of the tube until the tip of the terminal pin touches the tip of the drive member. As this occurs, the wire passes through the longitudinal opening and is deflected away from the tip of the terminal pin thus to clear the path of movement of the drive member, this being accomplished by a deflecting surface at the tip of the drive member. The end of the loaded tube is slipped over the companion terminal lug until the contact between the flat end of the tube and the mounting surface of the terminal lug orients the longitudinal axis of the tube along the longitudinal axis of the terminal lug. This allows the end of the drive member to pushingly engage the tip of the terminal pin while the contact between the terminal pin and the tube wall prevents the application of a lateral force to either the terminal pin or the terminal lug. The longitudinal movement of the drive member forces the terminal pin substantially longitudinally into intimate electrical contact with the terminal lug. As the tool is removed, the terminal pin passes through the end of the tube and the wire passes through the longitudinal opening in the wall thereof.

3,636,613

MACHINE FOR INSERTING WINDINGS INTO STATORS OF ELECTRIC MOTORS

Hans Droll, Bergen-Enkheim, Germany, assignor to Balzer and Droll K.G., Niederdorfelden, An der Rosenhelle, Germany

Filed June 23, 1969, Ser. No. 835,483
Claims priority, application Germany, July 9, 1968, B 76432
Int. Cl. H02k *15/02;* B23q *1/12*
U.S. Cl. 29—205 R 4 Claims



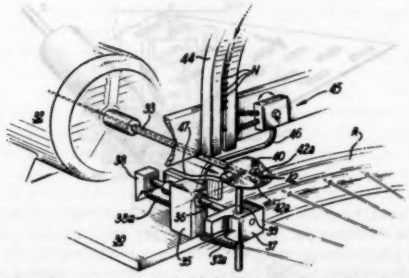
A machine for inserting windings into stators of electric motors and like machines which is provided with a machine frame divided into two parts with the upper part pivotally mounted on the lower part and carrying an insertion tool for the windings. Such a construction allows the adjustment of the head of the insertion tool according to the height of the operator. The pivot is disposed eccentrically on the lower frame part and preferably located near the front edge of the lower frame part and immediately above the upper edge of the lower frame part. The upper part may be adjustable by a continuously variable lifting device mounted on the lower frame part and flexible in any desired position of adjustment. Skirts, pivotally linked to the lower edges of the front and rear sides of the upper part shroud the corresponding upper edges of the lower frame part in all positions of the upper frame part.

3,636,614

WHEEL BUILDING MACHINE

Cornelis Damman, Nieuwkoop, Netherlands, and Raymond Joseph Lawton, Beeston, England, assignors to Churchill Automatic Assembly Ltd.

Filed Sept. 29, 1969, Ser. No. 861,580
Claims priority, application Great Britain, Oct. 2, 1968, 46,763/68
Int. Cl. B23q *7/10;* B23p *19/04*
U.S. Cl. 29—211 R 19 Claims



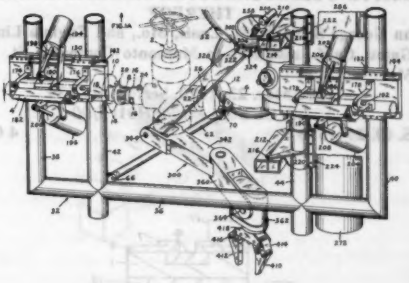
An automatic spoked wheel building machine including a wheel rim and hub support structure arranged to clamp the rim and retain a spoked hub in position centrally of the rim whilst spokes are inserted in series in a succession of groups into receiving holes in the rim, the wheel rim and hub being indexed to bring a hole in the wheel rim into alignment with a nipple retaining head supplied with nipples successively. There being adjacent the nipple retaining head a motor-driven screwdriver bit adapted to be advanced and retracted towards and away from the rim to collect a nipple during advancement, locate it on the end of the spoke and screw it onto the spoke to a predetermined condition of tensioning of the spoke and then to retract whilst a successive spoke hole in the rim containing a spoke is brought to the nipple-receiving head to receive a nipple upon the next successive advancing movement of the screwdriver bit.

3,636,615

JIG AND METHOD FOR PERFORMING WORK IN A WEIGHTLESS MEDIUM

Guy N. Rothwell, Jr., Kaneohe, Hawaii, assignor to Telecheck International, Inc.

Filed Mar. 18, 1969, Ser. No. 808,158
Int. Cl. B22d *19/10;* B23p *7/00*
U.S. Cl. 29—401 3 Claims



A jig for positioning a work-performing member relative to an installation in a medium in which said member is essentially weightless and on which installation said work performing member is to perform work, for example, changing a component, such as a valve, in an underwater pipeline in which the jig has clamping means for engagement with the installation structure and for moving the jig and vehicle attached thereto longitudinally along the structure for aligning the jig and vehicle with the component in the installation upon which work is to be performed, an arm and clamp for holding the replacement component and for positioning such replacement component in the installation, and an arm and clamp for engaging and removing the component to be replaced and a remote-controlled unit associated with said jig for disconnecting the component to be replaced and for connecting the replacement component in the underwater installation and the method for operating such jig.

3,636,616

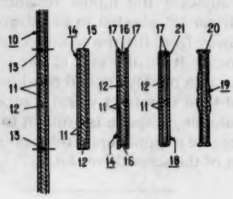
METHOD FOR MANUFACTURING COINS

Ake Gustav Vilhelm Remning, Finspang, Sweden, assignor to Aktiebolaget Svenska Metallverken, Vasteras, Sweden

Filed Oct. 22, 1969, Ser. No. 868,406
Claims priority, application Sweden, Oct. 24, 1968, 14388/68
Int. Cl. B23p *13/04*
U.S. Cl. 29—557 4 Claims

A method in the manufacture of coins, medals and like objects from plated material, the method including the steps of forming from the plated material discs having an extension which exceeds the extension of the blanks used in the embossing operation, recessing the peripheral edge surface of each disc so that the outer layer of the disc projects beyond

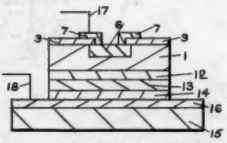
the central layer thereof, folding the outwardly projecting portions of the outer layers of each disc toward each other, the recess being made sufficiently large so that the said inwardly folded portions at least approximately reach each other, and embossing the resulting blanks to form coins or like objects.



3,636,617
METHOD FOR FABRICATING MONOLITHIC LIGHT-EMITTING SEMICONDUCTOR DIODES AND ARRAYS THEREOF

John George Schmidt, St. Louis, Mo., and Enghua Lim, Los Gatos, Calif., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 23, 1970, Ser. No. 21,639
Int. Cl. B01j 17/00; H01l 5/00
U.S. Cl. 29—578 4 Claims



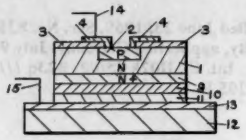
The disclosure herein relates to a method for fabricating planar, monolithic light emitting diodes and arrays thereof from an N-type intermetallic semiconducting material. Controlled regions of P-type conductivity are formed in the N-type material to form a PN-junction by means of controlled zinc diffusion through a multilayer diffusion-masking system comprising coherent films of silica and phosphorus-doped silica. Metallized ohmic contacts are formed on the top (front) surface and ohmic contact to the backside of the zinc diffused semiconductor material is made by a contact system comprising an alloyed multilayered structure of coherent films of tin, gold, nickel, and gold. Electrical leads and a lens are attached to the fabricated diodes to provided either discrete diodes or monolithic arrays thereof.

3,636,618
OHMIC CONTACT FOR SEMICONDUCTOR DEVICES

Arno Henry Herzog, St. Louis; James F. Caldwell, Hazelwood; John George Schmidt, St. Louis, all of Mo., and Enghua Lim, Los Gatos, Calif., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 23, 1970, Ser. No. 21,637
Int. Cl. B01j 17/00; H01l 7/02
U.S. Cl. 29—589 10 Claims

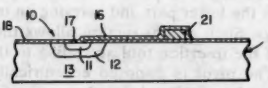
The disclosure herein relates to a method for forming ohmic contacts to the backside of solid-state semiconductor devices comprising a sequential deposition and alloying of a multilayered structure comprising, respectively, tin, gold, nickel and gold alloyed to the semiconductor body, which is then mounted on a gold-plated metal base with a gold epoxy preform. Other suitable base and preform materials are also disclosed.



3,636,619
FLIP CHIP INTEGRATED CIRCUIT AND METHOD THEREFOR

Joseph M. Welty, Los Altos Hills; Philip Shiota, San Francisco, and Roger W. Murray, Palo Alto, all of Calif., assignors to Teledyne, Inc., Mountain View, Calif.

Filed June 19, 1969, Ser. No. 836,219
Continuation of Ser. No. 657,201, July 31, 1967
Int. Cl. B01j 17/00; H01l 1/14
U.S. Cl. 29—591 1 Claim

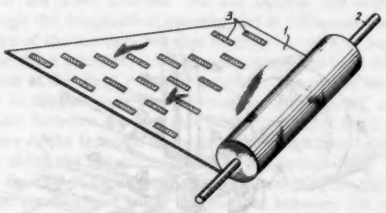


A flip chip integrated circuit having a raised contact pad for coupling to a substrate containing a printed circuit to which several chips are to be coupled. The raised contact pad is formed by etching a window in an active semiconductive region, depositing an aluminum mesa on the oxide passivating surface of a chip, and then evaporating an aluminum layer between the window and on top of the contact pad.

3,636,620
POROUS FLUID-COOLED ELECTRICAL CONDUCTORS AND METHOD FOR MAKING SAME

Hugh M. Long, Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,326
Int. Cl. H01b 13/00; H05k 3/00
U.S. Cl. 29—624 6 Claims



Disclosed are fluid-cooled, high-current capacity electrical conductors manufactured by spirally rolling or winding porous metal sheet into a desired shape.

3,636,621

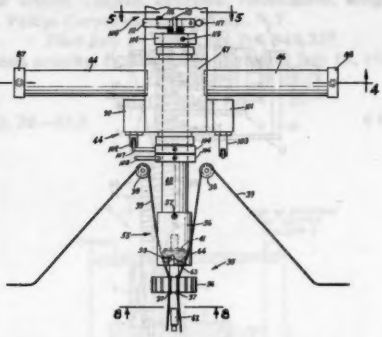
LEAD FORMING METHOD

Raymon H. Dammar, Minneapolis, Minn., assignor to Possis Machine Corporation, Minneapolis, Minn.

Original application July 14, 1966, Ser. No. 565,291, now Patent No. 3,474,515. Divided and this application Aug. 26, 1968, Ser. No. 794,832

Int. Cl. H02k *15/00*

U.S. Cl. 29—596 8 Claims



A method of attaching the leads of coils wound onto a slotted armature with the leads wrapped at least partially around the shaft of the armature and then connected to selected commutator hooks circumferentially spaced from the slots in which the coils are laid, which method is characterized by the fact that a pair of concentric sleeves shield the commutator to prevent engagement of the wire with the hooks during winding of the coils; and upon completion of a pair of simultaneously wound coils, rotation of the concentric sleeves both in unison and relative to one another, first in one direction and then the other, exposes the selected hooks and wraps the wire lead about them.

3,636,622

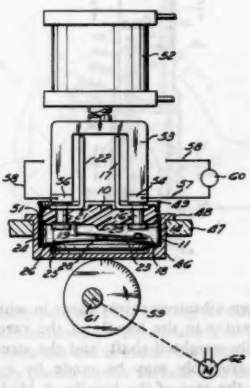
METHOD AND APPARATUS FOR MANUFACTURING THERMOSTATS

Donald J. Schmitt, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Original application Oct. 27, 1967, Ser. No. 678,586. Divided and this application Feb. 3, 1969, Ser. No. 796,074

Int. Cl. H01h *11/00, 11/02*

U.S. Cl. 29—622 5 Claims



A snap disc operated thermostat in which the switch body and disc case are free of surfaces which would limit the final assembled position. Variations in the sizes of the component parts are compensated for by partially assembling the device until the switch first closes. This provides a reference point which compensates for component part size variations. The body and case are then moved to a final position of assembly through a predetermined distance arranged to insure proper snap operation of the switch in both opening and closing. Such predetermined distance is selected to compensate for existing ambient temperature during assembly and for the amount of creep between one position of stability and the adjacent position of instability.

3,636,623

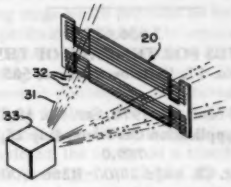
METHOD OF REMOVING INSULATED MATERIAL FROM INSULATED WIRES

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Frank B. Ramme, Lancaster, Calif.

Filed Dec. 31, 1969, Ser. No. 889,554

Int. Cl. H01b *13/00;* H05k *3/00*

U.S. Cl. 29—624 7 Claims



A method of fabricating equal length insulated wires which have insulation removed from selected portions thereof. The method includes the step of supporting the wires on each of two notched wire-support structures or jigs by placing the two back-to-back and by winding wires about the two jigs. The wires' ends are cemented at the jigs' ends. After the cement hardens the jigs are separated from one another so that each carries a plurality of wires with each wire having portions thereof exposed through notches in the jig. Each jig is placed in the stream of an abrasive-material carrier. The carrier passes through the jig's notches causing the abrasive material to erode the insulation material from the portions of the wires which are exposed through the notches. After the removal of the insulation material, the bare portions of the wires are treated, prior to removing the wires from the jig by cutting them to equal lengths.

3,636,624

METHOD AND APPARATUS FOR INSERTING LEAD COMPONENTS INTO CIRCUIT BOARDS

Erwin F. Bates, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

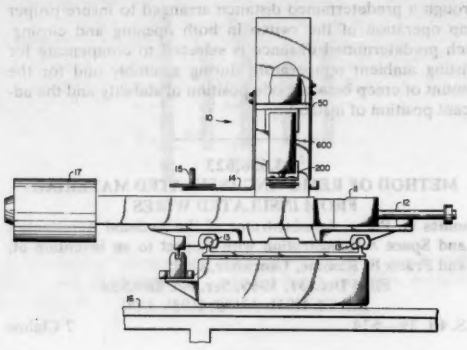
Filed Feb. 19, 1970, Ser. No. 12,690

Int. Cl. H05k *3/30, 13/04*

U.S. Cl. 29—626 22 Claims

An apparatus and method for inserting taped resistors of the type having at least two leads and like components into printed circuit boards. The apparatus comprises a feed mechanism utilizing a rotating feed wheel which in the method places components into engagement with the jaws of an insertion head whereupon the insertion head cuts the

component from the tape and carries the component down to a position directly over its insertion position on the circuit



board and a pusher rod forces the component or resistor down into the circuit board as the jaws separate.

3,636,625

APPARATUS FOR THE CARE OF THE BODY

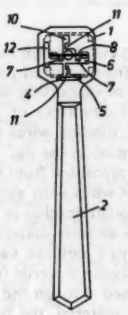
Gunter Pracht, No. 17, Nettelbeckstrasse, 565 Solingen, Germany

Filed Mar. 13, 1970, Ser. No. 19,293

Claims priority, application Germany, July 25, 1969, P 19 37 789.0

Int. Cl. A45d *29/00*; B26b *5/00*

U.S. Cl. 30—26 **10 Claims**



An apparatus which serves for the care of the body and which consists of a protective plate provided with an elongated handle, a cover plate and a cutting blade. The protective plate includes two planing holes and two slits, one extending transversely to the longitudinal axis and the other extending on the longitudinal axis of the apparatus. Each slit possesses at least one exposed tongue. The cover plate is provided with a bent-up tab which has at least one slit to enable it to be locked to the protective plate. The tab serves for the reception of an elongated guide slot in the removable and replaceable blade and passes through one of the slits of the protective plate whereby the exposed tongue engages the slit of the tab to clamp the blade.

3,636,626

DRY SHAVER

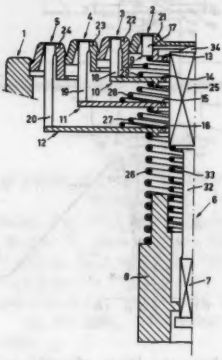
Frans Zuurveen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,306

Claims priority, application Netherlands, Aug. 31, 1968, 6812448

Int. Cl. B26b *19/14*

U.S. Cl. 30—43.5 **10 Claims**



A dry shaver having a single shaft actuating at least two shaving heads formed by concentric shear plates adapted to be elevated and depressed relative to each other, each shear plate provided with a cooperating rotary cutter member resiliently maintained in engagement with the associated shear plate by separate springs between each two cutter members, the shear plates being coupled to one another in their extreme raised and depressed positions.

3,636,627

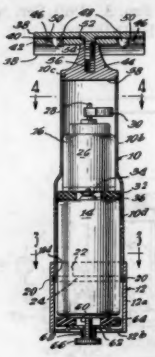
RAZOR WITH OSCILLATING HEAD

Victor Tiffin, R.R. 1, P.O. Box 20, South Elgin, Ill.

Filed Aug. 11, 1969, Ser. No. 848,924

Int. Cl. B26b *21/38*

U.S. Cl. 30—45 **8 Claims**



A battery-driven vibratory safety razor in which a battery-driven electric motor in the handle of the razor has a very short eccentrically weighted shaft, and the structure is such that the entire assembly may be made by inserting components through the rear of the handle. A blade carrier and blade support are mounted in a plug in the front end of the handle by means of a central threaded post which is on the

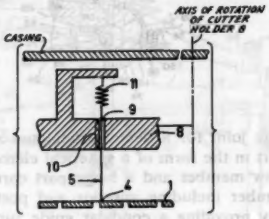
blade guard and impales a central hole in the blade carrier. The speed of rotation of the eccentrically weighted motor shaft and the size of the orbit in which the razor head moves are coordinated with observed characteristics of hand motions of shavers to minimize possible cutting of the face during shaving.

3,636,628

ELECTRIC SHAVER CUTTER ASSEMBLY

Eduard Willem Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 14, 1969, Ser. No. 841,237
Claims priority, application Netherlands, July 19, 1968, 6810337
Int. Cl. B26b *19/14*
U.S. Cl. 30—43.6 **6 Claims**



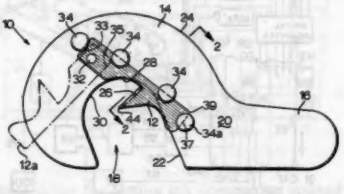
A dry shaver having a cutter with a shank part movable in a holder axially and slightly inclinable, and a blade part of the cutter urged against a shear plate by a spring, the shank, when inclined due to cutting action, having axially spaced parts thereof engaging the holder which locks the cutter's position from further axial or tiltable movement.

3,636,629

HOSE CUTTER

Theadore Baun, 231 Bellamy Road, Scarborough, Ontario, Canada

Filed Oct. 13, 1969, Ser. No. 865,624
Int. Cl. B23d *21/06*
U.S. Cl. 30—94 **5 Claims**



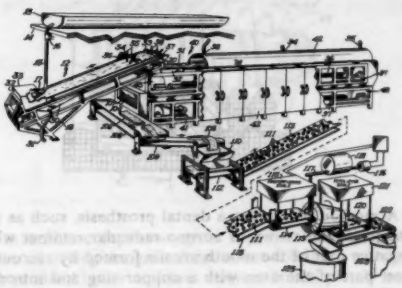
A hose and pipe cutter for cutting rubber and plastic hoses and pipes substantially perpendicularly to the axis thereof at the point where the cut is made; comprising a holder having a substantially planar upper surface and an indent formed in the holder, and a blade secured to the upper surface of the holder so that a cutting surface projects at least part way across the indent.

3,636,630

METHODS AND APPARATUS FOR CONTINUOUS MANUFACTURE OF CHEESE

Burnell E. Budahn, Norwood, Minn.

Continuation of application Ser. No. 676,397, Oct. 19, 1967, now abandoned. This application Aug. 11, 1970, Ser. No. 62,999
Int. Cl. A01j *25/00*
U.S. Cl. 31—89 **39 Claims**



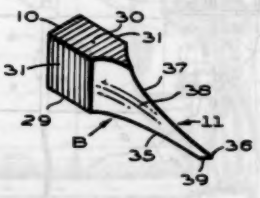
Disclosed herein are methods and apparatus for the continuous, completely automated manufacture of cheese from curd to hooping stage which provides an inclined, continuous stainless steel perforated conveyor to separate the whey from the curd and deposits the curd upon an imperforate stainless steel belt matting conveyor. The curd is forced initially into narrower transverse dimensions and thereafter permitted to expand laterally to facilitate the escape of whey while moving on the matting conveyor. When the matting process is essentially half completed, the curd mat is transferred to a second and similar belt conveyor running in the opposite direction and in so doing, is inverted. Live steam is applied to the matting curd as it moves along the matting conveyors within their housings. An automated guillotine knife cuts the curd mat vertically into inch slabs at the end of the matting conveyor and another conveyor moves the slabs into a milling machine which cuts the curd into 1 inch cubes from whence it is conveyed into an inclined, open-ended tumbling drum along with a proportionate amount of salt. As the salted curd leaves the drum, it is deposited in hoops for subsequent pressing and aging.

3,636,631

TEETH-SEPARATING WEDGES FOR USE DURING FILLING OPERATIONS

Benjamin F. Tofflemire, 41,301 Crest Drive, Hemet, Calif.

Filed Dec. 18, 1970, Ser. No. 99,609
Int. Cl. A61c *3/00*
U.S. Cl. 32—64 **2 Claims**

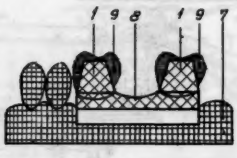


Teeth-separating wedges for use during filling operations wherein each wedge has a base rectangular in cross section with an interdental wedge portion projecting lengthwise from the base, the wedge portion being contoured to conform with the interproximal parts of the teeth against which the wedge portion is inserted.

3,636,632
METHOD OF MAKING DENTAL BRIDGES, DENTAL CROWNS, AND DENTAL CORONO-RADICULAR RETAINERS

Eugen Costa; Ioan Covaci, and Gheorghe Surca, all of Bucharest, Romania, assignors to Clinica Si Policlinica de Stomatologie Ortopedica, Bucharest, Romania

Filed Apr. 14, 1969, Ser. No. 815,925
Int. Cl. A61c *13/22*
U.S. Cl. 32—5 5 Claims

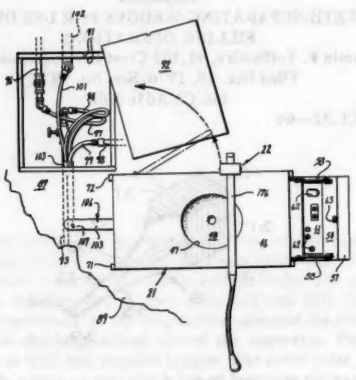


A method of making a dental prosthesis, such as a dental bridge, dental crown or corono-radicular retainer wherein a negative cast of the mouth area is formed by surrounding at least part of the area with a copper ring and introducing a casting material into said ring. Thereafter a plaster positive model is formed by introducing plaster into said cast. The model is fixed to the wall of a container and duplicated by casting a hydrocolloid material about the model and withdrawing said model from said hydrocolloid material upon setting to form a reversible hydrocolloid negative impression. An investment material is used to form a positive representation from the investment material and there is built up with a thin layer of wax on said positive representation the configuration of the prosthesis to be fashioned. Then a lost-wax casting mold is formed about the positive representation with the wax layer thereon and a molten metal is cast in the mold to produce the prosthesis.

3,636,633
DENTAL CONSOLE

Frank I. Fuller, Portola Valley; Shirl S. Fox, Menlo Park, and Ronald F. Keller, Aptos, all of Calif., assignors to Dental Designs

Filed Dec. 31, 1969, Ser. No. 889,471
Int. Cl. A61c *19/02*
U.S. Cl. 32—22 15 Claims

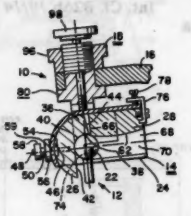


Dental console having a cabinet with a plurality of dental instruments mounted in the cabinet. A source of light is mounted in the cabinet. A flexible fiber optics cable is mounted in the cabinet and has one end positioned so that it is facing the source of light. Means is provided for mounting the fiber optics cable so that the other end of the fiber optics cable will remain in any one of a plurality of predetermined positions so that it can be utilized to supply general illumination to the mouth of the patient.

3,636,634
HINGE JOINT FOR DENTAL ARTICULATOR

Anthony J. De Pietro, 208 School Lane, Springfield, Pa.

Filed Oct. 28, 1970, Ser. No. 84,585
Int. Cl. A61c *11/00*
U.S. Cl. 32—32 12 Claims

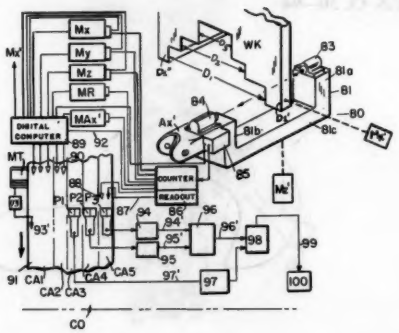


A hinge joint for a dental articulator is provided with a hinge part in the form of a spherical element carried by the lower bow member and a hinge part carried by the upper bow member including anterior and posterior guide parts conjointly providing a condylar guide surface seated upon the spherical element and an abutment engaging the side of the spherical element. The posterior guide part may be selectively rocked about its own principal axis relative to the anterior guide part and/or selectively moved back and forth in an arcuate path orbitally about the spherical element relative to the anterior guide part.

3,636,635
AUTOMATIC MEASUREMENT APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J.

Continuation-in-part of application Ser. No. 518,616, Jan. 3, 1966, now Patent No. 3,476,481. This application Oct. 7, 1969, Ser. No. 864,510
Int. Cl. G01b *5/00, 11/00*
U.S. Cl. 33—174 L 12 Claims



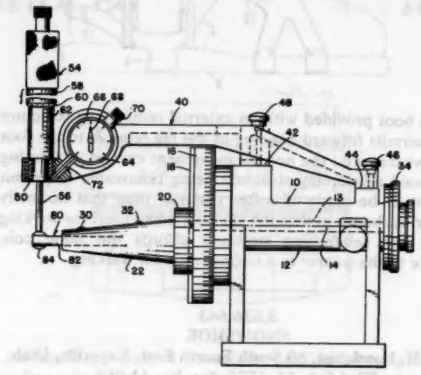
An automatic measurement apparatus is provided which employs a device for scanning work to be measured by the relative movement of a sensor and the work whereby the sensor senses one or more surfaces of the work. Means are provided for generating code signals indicative of the relative movement and further means are provided for visually presenting information as a readout which indicates the loca-

tions of one or more surfaces with respect to a base or bench mark location. In a particular form of the invention, the distance between two surfaces may be automatically indicated on said readout device.

3,636,636
RADIUS-SETTING GAUGE

Joseph W. Baldyga, Utica, Mich., assignor to Diamond Die & Mold Co., Mount Clemens, Mich.

Filed Oct. 24, 1969, Ser. No. 869,149
Int. Cl. B27g *23/00*
U.S. Cl. 33—185 **6 Claims**

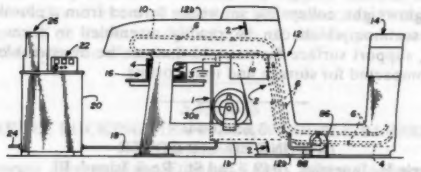


A radius-setting gauge for direct attachment to the frame of a radius dresser, including a movable micrometer to be set to the required radius, and an indicator for indicating the position of the micrometer.

3,636,637
METHOD AND APPARATUS FOR DRYING LIQUID DEPOSITED ON LIQUID RECEPTIVE MATERIAL

Charles N. Keith, Bedford, Tex., assignor to Graphic Pollution Control, Inc., Irving, Tex.

Continuation-in-part of application Ser. No. 1,030, Jan. 6, 1970, now abandoned. This application May 6, 1970, Ser. No. 35,146
Int. Cl. B01k *5/00*
U.S. Cl. 34—1 **28 Claims**

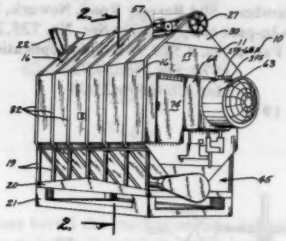


An electronic dryer for setting ink comprising spaced electrodes of an antenna radiating a high potential radiofrequency electromagnetic field through which is passed a liquid receptive material, such as paper, having wet ink thereon. A shield of dielectric material is positioned to extend between the electrodes to prevent arcing between the electrodes. In addition, ionized air around the electrodes is removed to further minimize the possibility of interelectrode arcing. A static electricity eliminator is employed to generate an electromagnetic field for removing static charges from the paper to prevent arcing between the paper and the electrodes.

3,636,638
AUTOMATIC GRAIN DRYER

Ronald T. Noyes, Frankfort, Ind., assignor to Beard Industries, Inc., Frankfort, Ind.

Filed Aug. 19, 1970, Ser. No. 65,042
Int. Cl. F26b *13/10*
U.S. Cl. 34—45 **9 Claims**

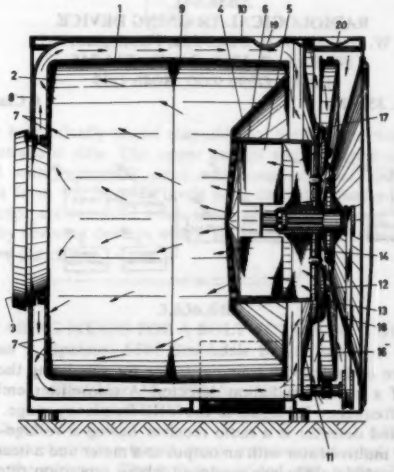


This invention comprises a grain dryer wherein the entire operation of drying the grain from a wet condition to one of a predetermined lower moisture content is completely automated, with an improved control circuitry including a bilevel photoelectric unit mounted within the dryer for refilling the drying column based purely upon moisture removal rate or shrinkage rate of the grain, the circuitry including further a temperature-controlled unit for sensing the temperature of the air as it passes through the grain column based on a predetermined temperature setting, and wherein the circuitry includes a second temperature-controlled unit for alternately turning the burner on and off during the heating cycle such that the grain is dried by a heat-pulsing action.

3,636,639
DRYER

Fredrik Adolf Schuurink, 27, Fr. Rooseveltlaan, Breda, Netherlands

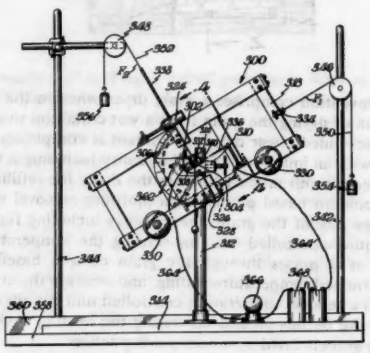
Filed Nov. 14, 1969, Ser. No. 876,984
Claims priority, application Netherlands, Nov. 21, 1968, 68/16657
Int. Cl. F26b *11/02*
U.S. Cl. 34—133 **5 Claims**



A laundry dryer having a rotatable drum and a fan to force heated air into the center of the drum. The heating means is

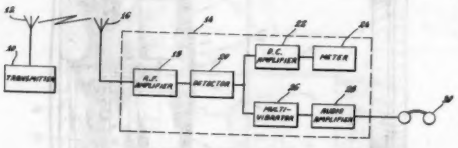
located between two sheets, the first being supported by the casing and the second being rotatable with the drum. The second sheet has an air passage on each side of it thus ensuring that incoming air picks all the heat available from it to improve the heating efficiency.

3,636,640
INCLINED PLANE
Robert F. Chambers, 504 Beverly Road, Newark, Del.
Continuation-in-part of application Ser. No. 735,259, June 7, 1968, now Patent No. 3,520,981. This application May 5, 1970, Ser. No. 34,750
Int. Cl. G09b *23/06*
U.S. Cl. 35—19 R **5 Claims**



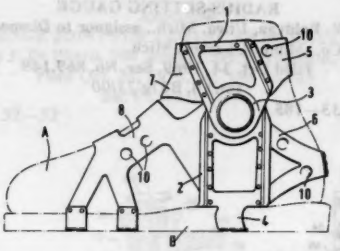
Apparatus for determining weight components of mass on inclined plane acting perpendicular and parallel to incline comprises adjustable inclined plane with mass supported upon plane. Force-applying structure is provided for forcing mass in upward direction perpendicular to inclined plane until mass just moves away from plane. Force-applying structure also forces mass in upward direction parallel to inclined plane until mass just moves in that direction.

3,636,641
RADIOLOGICAL TRAINING DEVICE
Samuel W. Daskam, R.D. 2 Box 360, Flemington, N.J.
Filed Apr. 7, 1969, Ser. No. 814,045
Int. Cl. G09b *9/00*; H04b *1/00*
U.S. Cl. 35—1 **6 Claims**



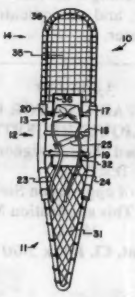
There is disclosed a training device for simulating the action of a nuclear radiation detector. A transmitter emits a single-frequency RF signal in the VHF frequency range. The simulated detector is a radio receiver having a voltage-controlled multivibrator with an output to a meter and a headset. Thus, audible clicks are produced whose repetition rate varies inversely with the distance from the transmitter. The use of a VHF frequency results in the simulated field being distorted by reflection from surrounding terrain.

3,636,642
SKI BOOT
Helmut Walther, Via Ponte Rocca 21, Saluggia, Vercelli, Italy
Filed Oct. 20, 1969, Ser. No. 867,493
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL **5 Claims**



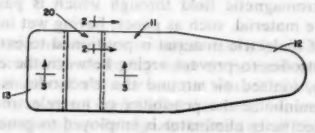
A ski boot provided with an external reinforcing structure which permits forward bending of the leg relative to the foot of the wearer, i.e., the normal movement carried out during skiing, said reinforcing structure being removable to permit the boot to be made of softer material than that normally used for ski boots so that the ski boot when used for walking without the reinforcing structure affords the same convenience to the wearer as a normal shoe for walking.

3,636,643
SNOWSHOE
Robert H. Lundquist, 80 South Fourth East, Kaysville, Utah
Filed Feb. 13, 1970, Ser. No. 11,069
Int. Cl. A63c *13/00*
U.S. Cl. 36—4.5 **7 Claims**



A lightweight, collapsible snowshoe formed from a plurality of sections which can be readily assembled to form a broad, support surface for use and that can be disassembled and compacted for storage and transporting.

3,636,644
IRONING BOARD COVER
Marjorie H. Janetzke, 2049 42nd St., Rock Island, Ill.
Filed Mar. 17, 1970, Ser. No. 20,192
Int. Cl. D06f *81/14*, *83/00*
U.S. Cl. 38—140 **8 Claims**



An ironing board cover having a pad structure for resting a hot iron thereon that extends transversely across the cover

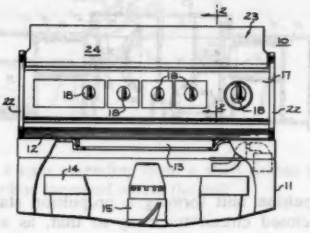
and is composed of upper and lower layers of fiber glass or other no-scorch material and a layer of insulating pad between the upper and lower layers. The pad is fixed to the upper surface of the cover along a transverse edge facing the head end of the ironing board with means providing a relatively smooth and continuous surface from the cover onto the pad.

3,636,645

APPLIANCE CONTROL CONSOLE

Clifford E. Erickson, and Harrison K. Linger, both of Louisville, Ky., assignors to General Electric Company

Filed Dec. 10, 1969, Ser. No. 883,888
Int. Cl. G09f *1/00*
U.S. Cl. 40—124.1 **3 Claims**



An appliance control console is provided having an upstanding cabinet structure with an operation instruction form support member pivotally secured thereto for movement between a retracted position and an extended position. The pivotal connection between the support member and the cabinet structure is spaced from the support member and positioned relative to the support member so as to cause the center of gravity of the support member to lie rearwardly of the pivotal connection when the support member nears the retracted position, and to cause the center of gravity to lie forward of the pivotal connection when the support member nears the extended position. By this arrangement when the support member is moved to a position nearing the retracted position, the center of gravity being spaced rearwardly of the pivotal connection will tend to rotate the support member rearwardly to the retracted position, and when the support member is moved to a position nearing the extended position, the center of gravity being spaced forwardly of the pivotal connection will tend to rotate the support member forwardly to the extended position. First and second stop means are provided to maintain the support member in the retracted and extended positions. A counterweight may be provided to facilitate the rotation of the support member without the use of excessive force.

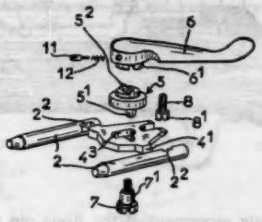
3,636,646

BARREL LOCKING MEANS FOR A DOUBLE-BARRELED SPORTING GUN

Georges Drevet, Saint-Etienne, Loire, France, assignor to Manufacture Francaise d'Armes & Cycles de Saint-Etienne, Cours Fauriel, Saint-Etienne, Loire, France

Filed May 2, 1969, Ser. No. 821,297
Claims priority, application France, Oct. 22, 1968, 210
Int. Cl. F41c *11/08, 11/10*
U.S. Cl. 42—44 **3 Claims**

A double-barreled drop-down sporting gun including means for locking the barrel in its closed condition by means of pins carried by the barrel and engaging the remaining barreled section of the gun upon operation of a toggle lever which is locked in its barrel unlocking position as long as the barrel is open. The gun is furthermore provided with means through which the trigger controlling the firing through one barrel is mechanically connected with the triggering means for the other barrel in such a manner that after firing one



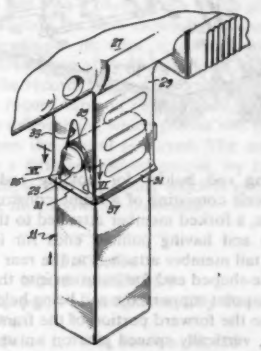
shot through one barrel the marksman may actuate the same trigger again so as to fire through the other barrel.

3,636,647

SEALED CARTRIDGE MAGAZINE

Morris Goldin, Orange, Calif., assignor to Hughes Tool Co., Culver City, Calif.

Filed Dec. 15, 1969, Ser. No. 885,036
Int. Cl. F41c *25/02*
U.S. Cl. 42—50 **7 Claims**



An hermetically sealed magazine for feeding cartridges to an automatic rifle. The upper end of the magazine is provided with removable caps which seal coaxial apertures which form the opposite ends of a cartridge feed-passage. The caps are removed when the magazine is inserted into a rifle by severing devices which are integral with a magazine well on the rifle.

3,636,648

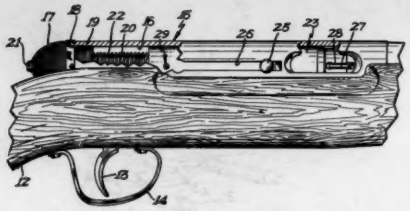
BEARING MEANS FOR A BOLT ACTION OF A GUN

William J. Spencer, 5501 Brookdale Drive, Brooklyn Park, Minn.

Filed Mar. 10, 1970, Ser. No. 18,081
Int. Cl. F41c *11/00, 11/06*
U.S. Cl. 42—16 **6 Claims**

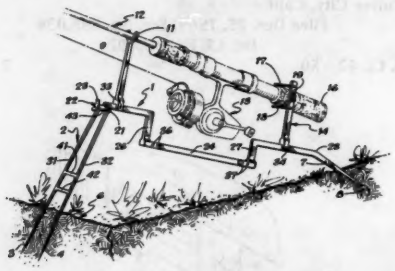
A gun comprises a barrel, stock, receiver and a bolt slidable in the receiver. The bolt is provided with a plurality of bearing units which include ball elements mounted in a housing which are secured in recesses in the bolt. The ball elements engage the interior surface of the receiver to facilitate

movement of the bolt. The firing pin of the bolt is also mounted for longitudinal movement by ball elements which



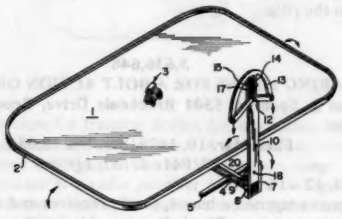
also facilitate movement of the firing pin and reduce wear thereto.

3,636,649
FISHING ROD HOLDER
Stanley H. Paiva, 2905 Julio Ave., San Jose, Calif.
Filed July 27, 1970, Ser. No. 58,231
Int. Cl. A01k *97/10*
U.S. Cl. 43—21.2 **3 Claims**



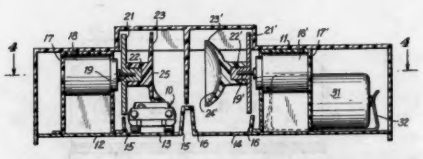
A fishing rod holder for holding rods equipped with spinning reels consisting of a frame constructed with an offset portion, a forked member attached to the forward end of the frame and having pointed ends for insertion into the ground, a tail member attached to the rear of the frame having a spade-shaped end for insertion into the ground, providing a three-point support, the rod being held by an open yoke attached to the forward portion of the frame and by laterally extending, vertically spaced pins on an upstanding member attached to the rear of the frame.

3,636,650
AMUSEMENT DEVICE
David Honig, 207-27 27th Ave., Bayside, N.Y.
Filed Mar. 2, 1970, Ser. No. 15,724
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 R **7 Claims**



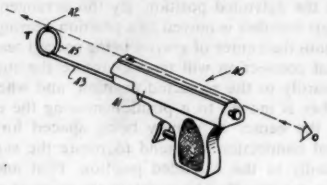
An amusement device having a plate centrally mounted on a universal joint and controls for tilting the plate on the joint has an upright control lever pivoted to the stationary support of the device. The upper end of the lever carries a wheel above and to one side of the upwardly directed exposed face of the plate. The wheel is turned and the lever is pivoted for tilting the plate in two intersecting planes.

3,636,651
TOY VEHICLE PROPULSION UNIT
Raymond J. Lohr, Erie; Merle R. Lewis, McKean; Walter Hubiak; Charles M. Kienholz, both of Lawrence Park, and Richard N. Carver, Erie, all of Pa., assignors to Louis Marx & Co., Inc., New York, N.Y.
Filed Aug. 20, 1969, Ser. No. 851,707
Int. Cl. A63h *11/10*
U.S. Cl. 46—1 K **5 Claims**



A propulsion unit forming a propulsion station located along a closed circuit trackway so that, as a toy vehicle travels along the trackway and passes through the propulsion station, a force will be applied to the toy vehicle to further propel it along the trackway.

3,636,652
TOY GUN WITH BUBBLE-FORMING SIGHT
A. J. Dumont, 3071 Dauphine St., New Orleans, La.
Filed Oct. 7, 1969, Ser. No. 864,370
Int. Cl. A63h *33/28*
U.S. Cl. 46—8 **7 Claims**

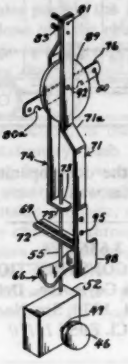


A toy gun that shoots a projectile, such as a stream of fluid, pellet or missile, has a bubble-making apertured frame element mounted far enough in front of the gun barrel to be dipped in a bubble-making solution without wetting the barrel. The apertured frame element is shaped and positioned to provide a sight for aiming the gun at a bubble.

3,636,653
WINKING AND BLINKING DOLL EYES AND ACTUATION THEREFOR
Robert Gardel, New York; Egon Gorsky, Brooklyn, and Richard S. Turshen, Elmont, all of N.Y., assignors to Dollac Division, Jacoby Bender, Inc., Woodside, N.Y.
Original application Aug. 11, 1964, Ser. No. 388,752, now Patent No. 3,429,068. Divided and this application Mar. 29, 1968, Ser. No. 734,510
Int. Cl. A63h *5/00*
U.S. Cl. 46—118 **6 Claims**

A doll with eyes which may be actuated by gravity and also

rods moved by a lever. The lever is moved by means



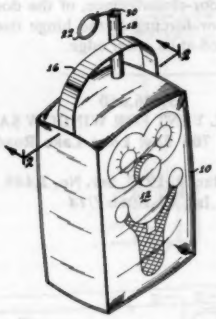
operated by a cam extending from a shaft driven by a motorized music box mounted within the doll.

3,636,654

STUFFED TALKING TOY REPRESENTING A RADIO

Larry D. Workman, Fountain Valley, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 12, 1970, Ser. No. 88,900
Int. Cl. A63h *5/00*
U.S. Cl. 46—175 AR 7 Claims



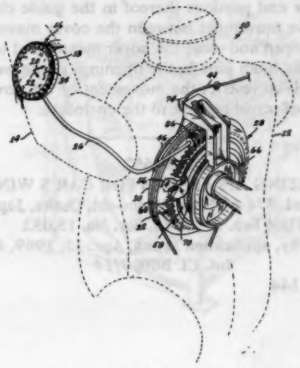
A stuffed talking toy representing a radio or other communication device that has an antenna, which is constructed for safe use by small children. The toy includes a flexible casing filled with a compressible stuffing, a phonograph within the casing of the type which has a spring motor that is wound by a pull cord, and a tube representing an antenna disposed on the casing. In order to prevent injury when a child brushes by the antenna, the antenna tube is not attached to the casing and therefore can be easily knocked over, but the pull cord extends through it and tension on the cord tends to maintain the antenna tube in an upright orientation. The phonograph within the casing is held away from the casing by a rigid tube through which the pull cord extends.

3,636,655

DOLL HAVING TIME INDICATING MEANS AND RECORD PLAYER COORDINATED THEREWITH

Irwin C. Porter, Quinter, Kans.; Jack L. Barcus, Cerritos; David L. Bear, Palos Verdes Estates, and James E. Marshall, Westminster, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 3, 1970, Ser. No. 60,442
Int. Cl. A63h *5/00*; G09b *19/12*
U.S. Cl. 46—117 8 Claims



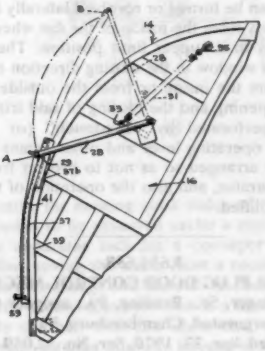
A doll with a simulated wristwatch whose hands can be set to different times and with a phonograph which plays one of twelve sayings that state the time shown by the hands of the watch. The phonograph includes a record with twelve grooves, the grooves having lead-in portions spaced about the periphery of the record. When a cord is pulled to wind a spring motor, the record turns in reverse until it hits a stop, the stop therefore determining which groove will be engaged by the needle when the record is played. The stop can be shifted to choose a different record groove, by turning the hands on the watch, so that the saying which is played always corresponds to the time shown by the watch.

3,636,656

DOOR ASSEMBLY

James Dennis, Culpeper, Va., assignor to City Tank Corporation, Culpeper, Va.

Filed Feb. 11, 1970, Ser. No. 10,425
Int. Cl. E06b *3/34*
U.S. Cl. 49—40 14 Claims



A door assembly for a vehicle having an enclosure with an opening therein generally including means mounted along

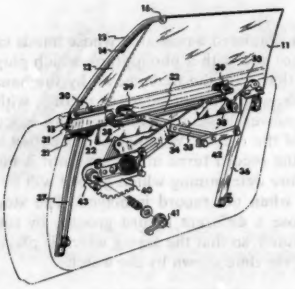
opposed sides of the opening providing opposed guide channels, the guide channels having opposed walls including openings therein, cover means for the enclosure opening operatively connected at one end thereof to the enclosure for movement between open and closed positions relative to the enclosure opening, and the cover means having a latch assembly spaced from the operative connection of the cover means to the enclosure, the latch assembly including a pair of latch pins movable along a line of travel intersecting the opposed guide channels, and actuating means for moving the latch pins along the line of travel thereof to selectively position the outer end portions thereof in the guide channels to permit relative movement between the cover means and the enclosure to open and close the cover means, and to position the ends of the latch pins in the openings in the walls of the guide channels to restrict the movement of the cover means along its line of travel relative to the enclosure.

3,636,657

REGULATING APPARATUS FOR CAR'S WINDOW

Sukeo Tsurumi, 574-62 Nina, Minoo-shi, Osaka, Japan

Filed Feb. 27, 1970, Ser. No. 15,052
Claims priority, application Japan, Apr. 11, 1969, 44/27700
Int. Cl. B60j *1/14*
U.S. Cl. 49—144 **2 Claims**



The present invention relates generally to a car side window lifting mechanism, and more particularly to a mechanism for moving up or down, as so desired, a triangular window glass positioned in front of a side window of a car, in synchronized relation with said side window glass. The triangular window can be turned or revolved laterally in the opening direction only from the inside of the car when said triangular window is in its upper limit position. The turning or revolving of the window in the closing direction can be practiced either from the inside or from the outside of the car, and both the opening and the closing of said triangular window can be performed by "one-touch" (or single-step) operation. The operating lever and other means used in the mechanism are arranged so as not to project from the wall face of the apparatus, and also the operation of these means is easy and simplified.

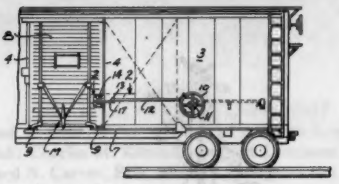
3,636,658

HOUSE CAR PLUG DOOR CONTROL MECHANISM

Luther L. Bollinger, Sr., Reading, Pa., assignor to Hennessy Products Incorporated, Chambersburg, Pa.

Filed Apr. 27, 1970, Ser. No. 32,049
Int. Cl. E05f *11/34*
U.S. Cl. 49—362 **7 Claims**

A door operating mechanism particularly adapted for railway freight car sliding doors of heavy "plug" type which are



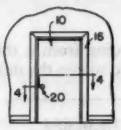
shifted into and out of the door opening before and after movement alongside the car wall.

3,636,659

DOOR CONSTRUCTION

Richard A. Bylicki, 14366 Coyle Ave., Detroit, Mich.

Filed Sept. 21, 1970, Ser. No. 74,197
Int. Cl. E05d *11/10*
U.S. Cl. 49—383 **5 Claims**



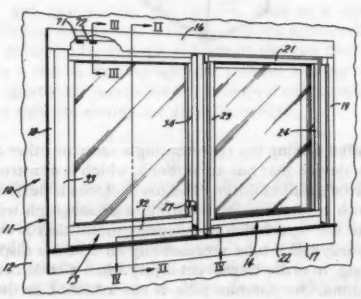
A swinging door is equipped with a key operated, double deadlock-type cylinder lock, operable only by key from either door side. The door panel is provided on the hinged edge thereof with one or more fixed dowel members projecting substantially from that edge, which are coaxially received telescopically, when the door is closed, in detent socket means in a frame jamb abutted by the door edge. This prevents removal of the door from the frame by removal, at the interior of the door-closed space, of the door hinge pintles, or by removal or forcing of the hinge itself, since the panel is double dogged at its other edge.

3,636,660

INTERNAL VENT FOR WINDOW SASH

Gerald D. Peterson, 704 East Long Lake Road, Bloomfield Hills, Mich.

Filed Mar. 9, 1970, Ser. No. 2,449
Int. Cl. E06b *7/14*
U.S. Cl. 49—408 **14 Claims**



A window construction having an improved external drainage system. The window construction includes a lower sill having a closed weep chamber formed therein. Suitable

passageways and openings extend from the upper surface of the inside sill plate to the weep chamber for permitting flow of water from the sill plate to the weep chamber. The sill also has a small drain opening extending through the forward wall of the weep chamber for permitting collected water to be externally drained. Water passing the window seals and collecting on the sill thus flows into the chamber and creates a pressure head at the drain opening sufficient to oppose high-outside air pressure, as due to wind effects, and thereby to prevent such wind from driving such sill water back into the building.

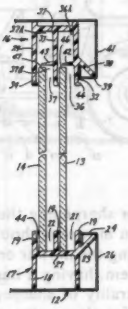
The window construction, in the disclosed embodiment, also includes a stationary sash provided with an air passageway extending from the weep chamber to the interior of the building. The separate air path receives sudden ones of such increases in outside pressure, as due to wind gusts, entering into the weep chamber through the drainage opening and thereby minimizes the spouting of water from the sill openings, which would otherwise be caused by inflow of outside air, until a sufficient water pressure head is created within the weep chamber for opposing such pressure increases.

3,636,661

PLASTIC MIRROR TRACK

Frederick W. Strawsine, Corunna, Mich., assignor to Strawsine Manufacturing Company, Corunna, Mich.

Filed July 22, 1970, Ser. No. 57,284
Int. Cl. E06b *3/46*
U.S. Cl. 49—413 **10 Claims**



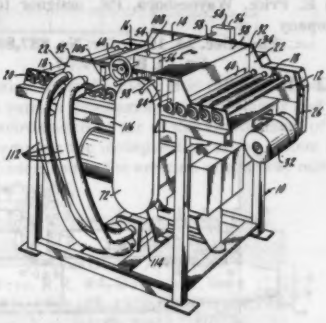
An improved guide track for slidably guiding and retaining the upper edge of a slidable panel, such as the mirror of a medicine cabinet. The guide track comprises a downwardly directed channel-shaped member having substantially parallel legs defining a groove therebetween into which slidably extends the upper edge of the panel. One of the legs is provided with a resilient fin extending outwardly into the groove and positioned substantially directly over the upper edge of the panel. The fin acts as a restraining device for preventing vertical bouncing of the panel when same is used in a vehicle, such as a mobile home. The fin resiliently deflects to permit the upper edge of the panel to be moved therepast when the panel is lifted upwardly relative to the bottom track whereby the panel can be installed or removed from the upper and lower tracks.

3,636,662

CIRCUIT BOARD CLEANING MACHINE

Paul Donald Maca, 4225 Rose St., Western Springs, Ill.

Continuation-in-part of application Ser. No. 700,453, Jan. 25, 1968, now abandoned. This application Dec. 10, 1969, Ser. No. 883,942
Int. Cl. B24b *7/06*
U.S. Cl. 51—5 **4 Claims**



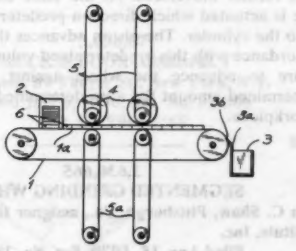
A circuit board cleaning machine having a roller conveyor adapted to convey the printed circuit boards to be cleaned, first into contact with a nonwoven, mineral-impregnated nylon brush which is run wet, then through a rinsing chamber, and then through a drying area. The brush is maintained sufficiently wet to form a hydroxide coating on the printed circuit board and to prevent the brush from liquefying during cleaning operation.

3,636,663

APPARATUS FOR MATTING GLASS SLIDES

Gerhard Menzel, Braunschweig, Germany, assignor to Propper Manufacturing Company, Inc.

Filed Nov. 28, 1969, Ser. No. 880,585
Int. Cl. B24b *21/04*
U.S. Cl. 51—138 **7 Claims**



An apparatus for matting glass slides of the type used to carry specimens to be observed under a microscope, for example. The apparatus includes a conveyor belt having an upper run for moving the slides from a receiving end of the upper run to a discharge end thereof. At the receiving end of the upper run of the conveyor belt is a chute for supplying the slides to the belt with the slides each projecting by a predetermined distance laterally beyond a side edge of the upper run. Between the ends of the upper run of the conveyor belt is a pressure roller made of a soft elastic material for pressing against each slide as the latter moves beneath

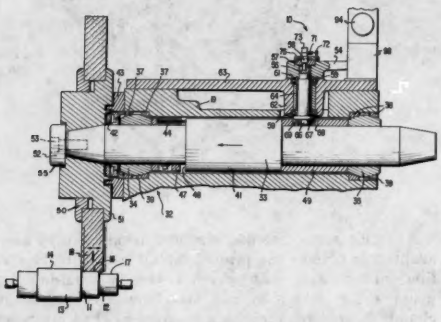
each pressure roller between the latter and the upper run of the conveyor belt. In alignment with this pressure roller, beyond the side edge of the upper run of the belt, is a high-speed grinding element situated to engage a surface of each slide as it moves beneath the pressure roller. At the discharge end of the belt is a receiving receptacle to which the ground slides are automatically delivered.

3,636,664

GRINDING WHEEL ADVANCING APPARATUS

Ralph E. Price, Waynesboro, Pa., assignor to Landis Tool Company

Filed Dec. 24, 1969, Ser. No. 887,895
Int. Cl. B24b *49/08*
U.S. Cl. 51—165.9 **12 Claims**



The apparatus of this disclosure is for advancing the grinding wheel axially for grinding the radial surface of a workpiece. The actual advance of the wheel is caused by a piston and cylinder combination, wherein the piston is connected to the wheel mounting and the cylinder is free to move in the direction opposite to that of the piston except for a restraining force imposed by a spring. The movement of the piston is stopped by the engagement of the grinding wheel with the work with fluid under pressure causing the cylinder to move against the action of the spring. The movement of the cylinder provides a signal which cuts off the supply of fluid under pressure to the cylinder and the cylinder is locked against further movement. At the same time, the metering device is actuated which directs a predetermined volume of fluid to the cylinder. The piston advances the grinding wheel in accordance with this predetermined volume of fluid under pressure to advance the wheel against the work by a predetermined amount for a predetermined depth of cut on the workpiece.

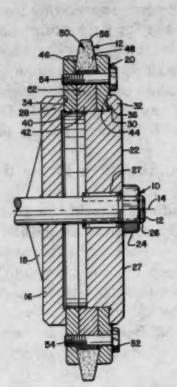
3,636,665

SEGMENTED GRINDING WHEEL

Milton C. Shaw, Pittsburgh, Pa., assignor to Grinding Wheel Institute, Inc.

Filed Apr. 15, 1970, Ser. No. 28,721
Int. Cl. B24d *5/06, 5/10*; B24b *55/02*
U.S. Cl. 51—206.5 **17 Claims**

A segmented grinding wheel assembly particularly suited for high-speed operation. The disclosed embodiments comprise wheel members having an outer peripheral recess in which grinding segments are positioned to define the grinding or working portion of the assembly. The recess and segments are related so that the segments are held in the recess by compressive reaction forces produced during wheel rotation. Additionally, the specification discloses an arrangement particularly adapted for supplying cooling or lubricating fluid to the wheel periphery. The arrangement comprises an inwardly open, circumferentially extending fluid-receiving trough carried by the wheel. The trough is connected to the recess by generally radially extending passages such that during wheel



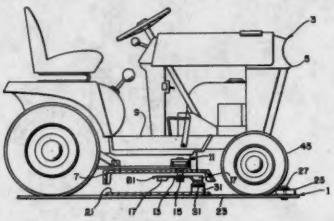
rotation fluid moves outwardly to the recess and between the segments under the influence of centrifugal force.

3,636,666

SHARPENER FOR SHARPENING ROTARY LAWN MOWER BLADES

Jay H. Brayman, P.O. Box 2, Dorsey, Ill.

Filed July 1, 1970, Ser. No. 51,524
Int. Cl. B24b *19/00*
U.S. Cl. 51—250 **10 Claims**



A sharpener for sharpening the blades of a multiple-blade rotary power lawn mower without removing the blades from the mower, utilizing the mower engine for rotating the blades for sharpening them, having a base over which the mower is moved and a plurality of sharpening stones secured on the base in position for sharpening the cutting edges of all the blades of the mower at one time when the mower is moved into a blade-sharpening position over the base and the blades are lowered for wiping contact with the stones.

3,636,667

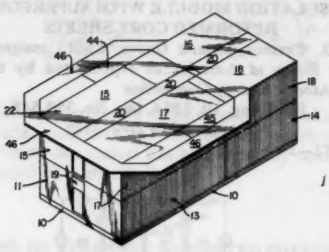
PREFABRICATED BUILDING STRUCTURE FOR OFFSHORE CREW QUARTERS AND THE LIKE

Frank C. Walz, Golden, and Jerry B. Davis, Lakewood, both of Colo., assignors to Levingston-Armadillo, Inc., Denver, Colo.

Filed Jan. 21, 1969, Ser. No. 792,475
Int. Cl. E04h *1/00*
U.S. Cl. 52—79 **8 Claims**

A building structure has prefabricated elements preassembled into modular units which are transportable to a building site for their assembly together on the same level or stacked one on another to provide a building of the desired number of rooms or stories. An outer nonporous weather-resistant coating preferably of fiber glass covers the entire exposed ex-

terior surface areas to form a sealed enclosure. Each modular unit is a self-sustaining individual structure and includes a floor panel, upright wall panels and a unitary skid under the floor panel. The preferred prefabricated elements and the modular units have relatively broad joint surface areas which



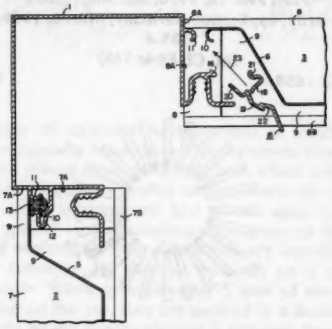
are secured together preferably by an adhesive to provide an essentially unitary structure. Multilayered prefabricated ceiling panels and prefabricated side wing panels extending outwardly from the ceiling panels form a strong aircraft-landing deck on top of the building.

3,636,668

JOINING MEMBER FOR BUILDING CONSTRUCTIONS

James D. Klingensmith, Allegheny Township, Westmoreland County, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed July 9, 1970, Ser. No. 53,501
Int. Cl. E04b *1/40*
U.S. Cl. 52—282 **3 Claims**



An elongated joining or splicing member for joining together two elongated rigid structures along adjacently disposed but spaced-apart ends thereof. The joining member has a web or tail portion and a channel portion at one end of the web portion for engaging and joining the ends of the rigid structures together when the web portion of the joining member is moved into locking engagement with one of the rigid structures.

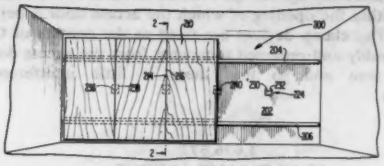
3,636,669

PANEL SYSTEMS

James R. Attkisson, 5205 York Road, Alexandria, Va.

Filed Jan. 12, 1970, Ser. No. 2,306
U.S. Cl. 52—38 **5 Claims**

A paneling system employs a plurality of panels having a series of shaped connecting members mounted thereon, and a series of complementary hanger means on an upright sustainer, such as a wall or stud system. The connecting members interengage with the hanger means to mount the panels in preselected orientation; and in a modification of the system, a separate upright sustainer supports one or more panels through the coactive relation of a series of interengaged stringers having frictional block means to retain a



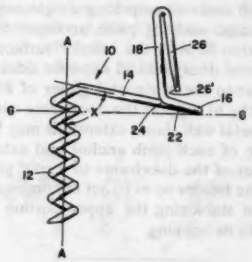
selected position while the block is in place. Removal of the block means permits disassembly of the sustainer and panels. Illustrated environments of use of this embodiment of the invention contemplate the incorporation of the system in temporary barricades, and in the erection of roadway markers of nonpermanent nature.

3,636,670

GROUND ANCHOR

Norman V. Frye, R.R. #4, Davenport, Iowa

Filed Feb. 25, 1970, Ser. No. 14,105
Int. Cl. E02d *5/80*
U.S. Cl. 52—157 **1 Claim**



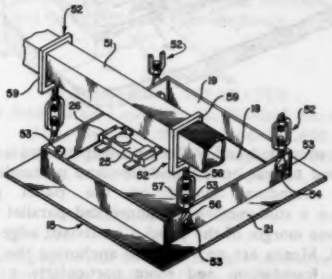
A ground anchor having a basic part in the form of a one-piece rodlike element of steel or the like including a ground-penetrating helix and a leg extending from the top of the helix and terminating in an area-increasing, ground-engaging base from which post-supporting means rises.

3,636,671

ACCESS DOOR ASSEMBLY

Harry W. Hollister, 89 Thayer St., New York, N.Y.

Filed July 6, 1970, Ser. No. 52,508
Int. Cl. E06b *1/60*
U.S. Cl. 52—211 **8 Claims**



An access door assembly comprising a frame with an inwardly extending flange, a removable access door and clamp-

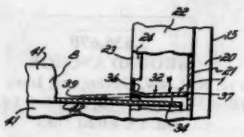
ing devices that are adjustable and so adapted that they can be adjusted to attach the access door assembly to bar members already randomly provided within the ceiling or wall structure at variable distances from the opening whereby a flush and tight clamping engagement will be made of the access door assembly against the exterior surfaces of the ceiling or wall within the opening of which the access door is being secured. The clamp devices are fixed at the corners of the door assembly and removed somewhat from the access door opening area and so that there is little interference therefrom.

3,636,672

SNAP-IN JAMB ANCHOR

Kenneth W. Fink, Cincinnati, Ohio, assignor to The Steelcraft Manufacturing Company

Filed Dec. 12, 1969, Ser. No. 884,578
Int. Cl. E06b *1/04, 1/16*
U.S. Cl. 52—214 **7 Claims**



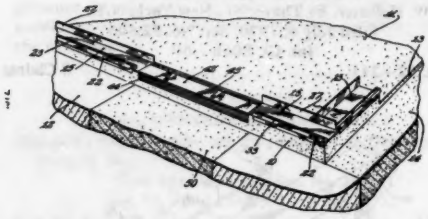
A snap-in jamb anchor comprising a right angular bracket having a horizontal wedging plate arranged to establish a wedge-type friction fit with the interior surface of channel-shaped sheet metal doorjambs at opposite sides to provide a connection between the horizontal girder of a building and the jambs, thereby to support the doorframe within an opening of a sheet metal wall. Jamb extensions may be secured to a vertical flange of each jamb anchor and extend upwardly above the header of the doorframe to a roof girder which is located above the header so as to act in combination with the jamb anchors in stabilizing the upper portion of the metal doorframe within its opening.

3,636,673

BUILDING CONSTRUCTION

Donald G. Monroe, Prospect Heights, Ill., assignor to Active Garage Builders Inc., Chicago, Ill.

Filed Jan. 9, 1970, Ser. No. 1,721
Int. Cl. E04b *1/40*
U.S. Cl. 52—293 **16 Claims**



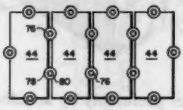
A combination stud and wallboard baseplate has a bottom panel adapted to rest on a foundation and upstanding longitudinally extending flanges on the panel provide therebetween a stud-receiving channel and parallel thereto and along one margin of the panel a wallboard edge-receiving channel. Means are provided for anchoring the bottom panel to a foundation, and more particularly a poured concrete foundation and comprising depending spaced parallel anchoring flanges. One of the upstanding flanges is equipped to facilitate securing a stud in place. On one edge of the baseplate is an outwardly and downwardly sloping combination mounting gauge for the plate and serving also as a siding spacer and starter. An improved door frame arrangement as well as threshold structure are provided.

3,636,674

INSULATION MODULE WITH SUPERPOSED DEFORMED CORE SHEETS

George D. Cremer, Lemon Grove, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commision

Filed Aug. 10, 1964, Ser. No. 388,548
Int. Cl. E04b *2/44, 1/78*
U.S. Cl. 52—509 **11 Claims**



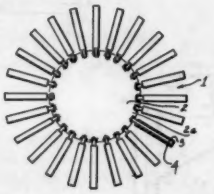
Insulation modules having a core of relatively movable, flat and corrugated metal sheets assembled between opposed faceplates and having deformable, seal-forming portions projecting beyond the faceplates. Methods of fabricating such modules and of forming them into modular insulation assemblies.

3,636,675

ARTICLE OF MANUFACTURE

Walter Hellerich, Heilbronn, Germany, assignor to Arbed S.A., Arbed-Felten & Guilleaume Vereinigte Drahtwerke, Mulheim, Germany

Filed Feb. 18, 1970, Ser. No. 12,266
Claims priority, application Germany, Mar. 6, 1969, P 19 11 389.4
Int. Cl. E04c *5/00*
U.S. Cl. 52—659 **14 Claims**



A metallic reinforcing structure is embedded in a synthetic plastic plate and comprises a central disc-shaped portion and a plurality of elongated metallic wires projecting radially outwardly from the disc-shaped portion. Male and female threaded members are provided on the disc-shaped portion such that stresses entering from the former into the disc-shaped portion are uniformly transmitted into the synthetic plastic plate via the metallic wire.

3,636,676

METHOD OF ERECTING PREFABRICATED SHELTER

Charles W. Moss, Ann Arbor, Mich., assignor to Tension Structures Inc., Milan, Mich.

Original application Jan. 14, 1969, Ser. No. 790,930, now Patent No. 3,562,975, dated Feb. 16, 1971. Divided and this application June 3, 1970, Ser. No. 42,976
Int. Cl. E04b *2/12;* **B23p** *11/00;* **E04b** *1/32*
U.S. Cl. 52—747 **4 Claims**

A shelter which has panels bowed and secured together in a stressed condition to define a domelike building. The

panels are retained in the stressed condition by supporting structure, and the stressed condition of the panels cooperates in locking the assembled parts together. A flexible joint is

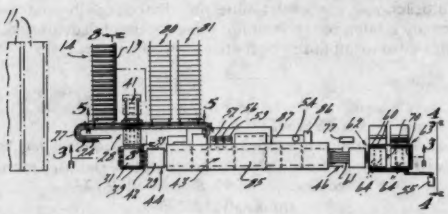
provided between the panels to aid in erecting and in retaining the structure together and to provide a weather seal. A method whereby the shelter can be erected by stressing the panels in sequence is provided.

3,636,677

METHOD OF STRIPPING DEPOSITED SHEETS OF METAL FROM CATHODES AND WASHING, STACKING AND WEIGHING THE SHEETS

Bernard J. McNamara; Syl Daniluk, and Cornelis J. Nijhuis, all of Windsor, Ontario, Canada, assignors to McInnis Equipment Limited

Filed May 11, 1970, Ser. No. 35,997
Int. Cl. B65b *13/00*
U.S. Cl. 53—3 **10 Claims**



A plurality of cathodes having sheets of electroplated material on opposite faces thereof are removed from a plating tank and placed on an advancing rack which delivers the cathodes seriatim to a stripping station where the sheets of deposited metal are removed and placed upon conveyors moved to spaced vertical position and advanced through a plurality of washing stations. The sheets are deposited on a horizontal conveyor and stacked vertically on a car on a weighing scale. When approximately 5 tons of sheets have been stacked on the car, they are secured in a bundle and a label with the weight printed thereon is attached thereto.

3,636,678

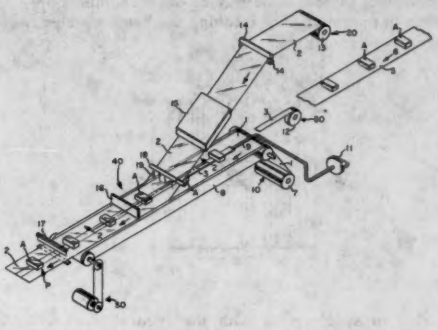
PACKAGING METHOD AND PACKAGE MADE THEREBY

Frank George Maros, Media; Jeffrey Scott May, Claymont, and Harold Eugene Ramsey, Wilmington, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 9, 1970, Ser. No. 17,694
Int. Cl. B65b *61/18, 31/04*
U.S. Cl. 53—14 **7 Claims**

A method of packaging an article between at least two moving package members, such as plastic film in web form, including drawing one member into skinlike engagement with the article and into sealing contact with the other member by means of a suction means positioned between the members.

The method is continuous in operation and one of the package members may be electrostatically treated prior to drawing. A third package member is positioned between the suction means and the package member drawn into engagement with the article and the other package member thereby to shield the suction means from the drawn member during



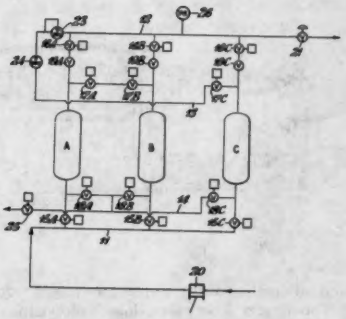
the drawing operation. The third package member also may serve as a tear strip in the package formed by this method.

3,636,679

SELECTIVE ADSORPTION GAS SEPARATION PROCESS

Louis Bela Batta, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 787,847, Dec. 30, 1968, now Patent No. 3,564,816. This application Jan. 4, 1971, Ser. No. 103,768
Int. Cl. B01d *53/84*
U.S. Cl. 55—26 **10 Claims**



Gas mixtures such as air are separated in selective adsorbent beds to produce low-pressure product such as oxygen by simultaneous compressed air-oxygen introduction at opposite ends for partial repressurization, further repressurization with only air, and then product oxygen discharge.

3,636,680

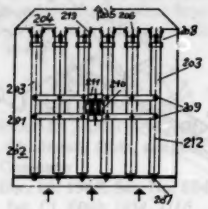
FILTERING APPARATUS

Gunther Seidel, Karl-Laeue Str. 12, Bielefeld, Germany

Filed Sept. 26, 1968, Ser. No. 762,690
Claims priority, application Germany, Sept. 29, 1967, S 112190; Apr. 26, 1968, P 17 57 333.0; July 13, 1968, P 17 82 057.4
Int. Cl. B01d *46/04*
U.S. Cl. 55—291 **39 Claims**

A filtering apparatus having a single chamber or a plurality of chambers for the cleaning of dust-laden gases by means of flat filter bags. These filter bags are arranged upright and individually twistable at the inside of a casing. The bags are connected by connection rods which are fastened at the nar-

row side of the bags and for the purpose of cleaning oscillatable in groups around their pivot axes. A filtering apparatus having a plurality of gas flow chambers, and valves operated by a control shaft to close some chambers for cleaning the filter element therein while leaving other chambers open for continuous operation. The cleaning mechanism is electrically



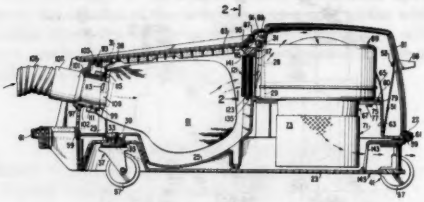
operated in synchronism with the control shaft via cam means on the control shaft which actuate switches to operate the cleaning means. A valve structure comprising a plate operated via cam and follower means by the control shaft and including guide rods and slots to allow the valve plate to undergo linear and pivotal movement.

3,636,681

VACUUM CLEANER FILTER ASSEMBLY

William A. Batson, Pickens, and Charles T. Fromknecht, Anderson, both of S.C., assignors to The Singer Company, New York, N.Y.

Filed Mar. 20, 1970, Ser. No. 21,331
Int. Cl. B01d *46/00*
U.S. Cl. 55—372 **1 Claim**



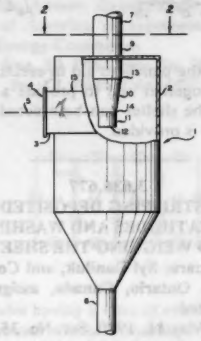
A vacuum cleaner of the canister variety for domestic use having upper and lower housings sandwiching an intermediate housing therebetween. An air inlet is formed at the front of the upper housing and an exhaust housing is secured to the rear of the lower housing. A dust bag is positioned between the upper and intermediate housing and is separated from a motor blower assembly by an apertured partition wall. A washable permanent secondary filter, fitted about a wire form frame, is positioned on the dust bag side of the aperture in the partition wall by means of a pair of slotted ribs which receive a portion of the wire frame and a cam-shaped rib which also holds a portion of the wire frame. The exhaust housing includes a sliding door having spaced air slots and a rear wall having similar spaced air slots alternately offset from those of the door. A hose assembly blower connection aperture is formed in the exhaust housing adjacent to the slotted rear wall. During vacuum operation the sliding door is positioned in front of the hose assembly blower aperture and air is exhausted from the motor blower assembly through both sets of slots, but during blower operation the door is positioned in front of the rear wall with the solid portion of the door closing off the slots in the wall of the exhaust housing to concentrate all the exhaust air through the hose assembly blower connection aperture.

3,636,682

CYCLONE SEPARATOR

John B. Rush, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Mar. 8, 1968, Ser. No. 711,808
Int. Cl. B04c *5/04*
U.S. Cl. 55—459 **1 Claim**



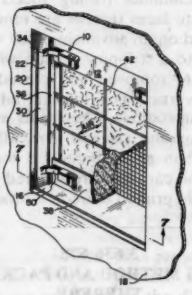
A cyclone separator suitable for separating particulate matter from a gas stream in which various sections of the multisectional gas outlet tube are dimensionally and positionally related to the inlet horn and its area in such relationships as to result in the high-efficiency separator.

3,636,683

FILTER WITH LATCH ASSEMBLY

Roy B. Francis, Dallas, and Billy D. Holmes, Montalba, both of Tex., assignors to Delta P. Incorporated, Dallas, Tex.

Filed Dec. 30, 1969, Ser. No. 889,225
Int. Cl. B01d *27/00*
U.S. Cl. 55—493 **4 Claims**



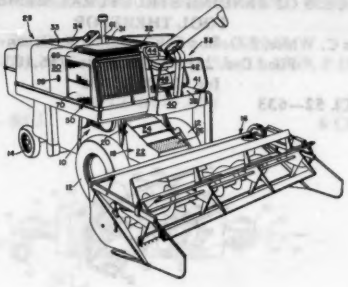
A filter assembly includes a latch which engages a detent located at a substantial height above the surface to which the latch is secured. The overall reach of the latch mechanism is variable as a consequence of a double pivot. A panel, frame, or other movable body, which is secured by means of this latch assembly, is continuously compressed against its seat due to the positive compression of the latch mechanism against the detent. The particular arrangement of the pivots of the latch mechanism provides an over-the-center action which not only locks the latch, but moreover causes the compressing action to be increased should forces be exerted to withdraw the movable, secured body prior to unlocking of the latch. The continuously exerted compression is utilized to continuously seal filtering elements against lateral leakage.

3,636,684

ENGINE ENCLOSURE FOR A HARVESTING MACHINE

Bernard Francis Vogelaar; James Peter Doering, both of Moline, and Felix Stanley Pasturczak, East Moline, all of Ill., assignors to Deere & Company, Moline, Ill.

Filed Aug. 25, 1969, Ser. No. 852,689
Int. Cl. A01d *41/12*
U.S. Cl. 56—14.7 14 Claims



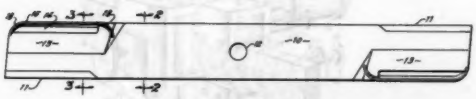
A self-propelled combine has a mobile main separator body with an elevated grain tank mounted on a central portion of the body and a forward operator's station and engine enclosure mounted side by side at the forward end of the body immediately in front of the grain tank. The engine enclosure has an air outlet in its outer lateral side and air inlets in both the top and front side of the enclosure. A transversely oriented internal combustion engine is mounted in the enclosure and has a radiator opposite the outlet opening. A fan in the outlet opening draws air through the inlet openings and through the radiator, discharging it through the outlet opening at the side of the combine. The air drawn through the radiator is filtered by means of screens in the air inlets, and the top and front of the enclosure are provided with louvers to deflect part of the air along the surface of the screens to carry away foreign material collected thereon, the contaminated air bypassing the radiator and being discharged out the side of the combine with the cooling air.

3,636,685

ROTARY LAWNMOWER BLADE

Clifford H. Speckman, Aurora, Ind., assignor to Tony Locono, Modesto, Calif., a part interest

Filed Mar. 15, 1971, Ser. No. 124,031
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 10 Claims



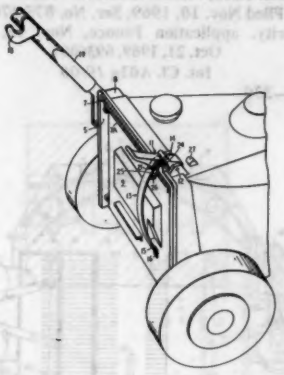
A rotary lawnmower blade having cutting edges along the leading edges thereof adjacent the respective ends in which the trailing edges opposite the cutting edges each have an opening therethrough and a vane paralleling the opening that is canted to create an updraft through the opening and thereby pull grass up into the cutting circle of the blade.

3,636,686

SAFETY FLAP ARRANGEMENT FOR DISCHARGE APERTURES IN ROTARY LAWNMOWER BASEPLATES

Dolph Allan Meyer; Ross Leslie Phelps; David Paul Seidel; Edward Henry Sykes; Ian Sweet Clipsham; Donald Gray, and Theodore Demetrius Ractivand, all of Milperra, New South Wales, Australia, assignors to Victa Limited, Milperra, New South Wales, Australia

Filed Sept. 9, 1970, Ser. No. 70,779
Claims priority, application Australia, Apr. 8, 1970, PA0845/70
Int. Cl. A01d *55/18*
U.S. Cl. 56—320.2 10 Claims



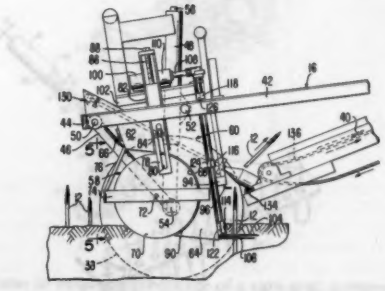
A pivoted flap arrangement for covering the grass discharge opening in a rotary lawnmower, and comprising a cover plate, a pivoted handle on the baseplate for opening the plate, a flexed spring leaf interconnecting the plate and the handle, and an overcenter (or toggle) action between the spring and the handle whereby resilient opening force is applied to the plate when the handle is operated and when the plate has pivoted to a fully open position the handle and plate are automatically returned.

3,636,687

ASPARAGUS-HARVESTING MACHINE AND METHOD

Robert T. McKissick, Tracy; Vincent W. Sebastian, Pollock Pines; Ray D. Davis, and Arthur R. Sasser, both of Tracy, all of Calif., assignors to AG-Bilt, Tracy, Calif.

Filed Oct. 9, 1969, Ser. No. 864,991
Int. Cl. A01d *45/00*
U.S. Cl. 56—327 A 10 Claims



A machine for harvesting asparagus and other similar crops wherein the machine has a plurality of knives which

move through the ground and are caused to shift laterally to sever the spears of asparagus when the height of the spears are sensed and are found to be above a predetermined minimum value. The sensing means includes an electrical switch provided with a swingable actuating arm transverse to the path of travel of the machine. A roller assembly is provided to grasp the spears after they have been severed from the ground and to move the spears onto a conveyor system for movement to a collection station on the machine.

3,636,688

APPARATUS FOR PICKING GRAPES

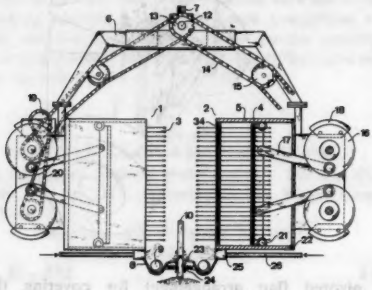
Andre Fontan, 11, rue Nationale, Nogaro, and Rene Benac, Avenue Saint Roch, Mirande, both of France

Filed Nov. 10, 1969, Ser. No. 875,470

claims priority, application France, Nov. 12, 1968, 1283; Oct. 21, 1969, 6936001

Int. Cl. A01g *19/00*

U.S. Cl. 56—330 **7 Claims**



A mobile grape harvester for straddling vines. Batteries of needles are reciprocated horizontally to impact the grapes and thereby disengage them. Spacing of the needles sufficiently close to each other assures that each grape is impacted. The striking force of each needle is limited and the needles are organized to recoil so that grapes are dislodged but vines and supports are not damaged. A grape-receiving arrangement is positioned below the battery of needles and it seals automatically about the stocks of the grape vines. The grape-receiving arrangement includes a conveying system to transport the grapes.

3,636,689

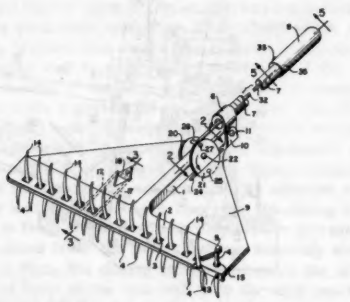
DUAL SELF-CLEANING RAKE

John W. Gallimore, P.O. Box 13, Fredericksburg, Va.

Filed July 3, 1969, Ser. No. 839,014

Int. Cl. A01d *7/00*

U.S. Cl. 56—400.1 **9 Claims**



A hand-manipulable rake for lawn and garden use wherein two sets of rake teeth are interpivotally connected and related in a way such that pivoting of the two from a first normal and operating position to a second or cleaning position, acts at one and the same time to clean both rakes of accumulated debris. Pivoting is effected in a simple direct manner by the movement axially of the rake handle, of an end cap carried thereby. In operating position the two sets of teeth are fixedly related and freely alternatively usable so that the time interval between tooth-cleaning operations is more than doubled.

3,636,690

PROCESS OF BENDING STRUCTURAL MEMBERS AND TOOL THEREFOR

James C. White, P.O. Box 5495, Station B, Greenville, S.C.

Filed Dec. 23, 1968, Ser. No. 786,103

Int. Cl. E04c *3/30*

U.S. Cl. 52—633 **3 Claims**

Structural members such an angle iron or channel members are bent to a desired radius by crimping the flange or flanges thereof to provide V-shaped pockets or crimps therein. The crimping tool includes a crimping jaw which, before crimping, locates the tool against the leg of the angle or channel member but which swings slightly away from it during crimping movement effected on the intersected flange so as to avoid tearing or shearing the flange while still locating the crimp very close to the leg. An improved form of angle or channel member is provided with openings along the intersection of the leg and flange to allow accurate positioning of the crimp and to further militate against tearing or shearing of the flange.

3,636,691

APPARATUS FOR WRAPPING A CONDUCTOR BUNDLE

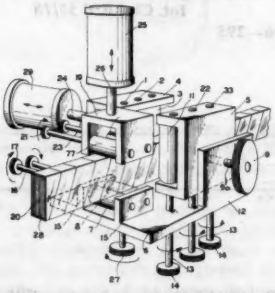
Roger Bonvallet, St. Louis, Haut Rhin, France, assignor to Etablissements Emile Haefely SA, St. Louis, Haut-Rhin, France

Filed Dec. 9, 1969, Ser. No. 883,555

Claims priority, application France, Dec. 10, 1968, 18479/68

Int. Cl. B65h *81/08, 81/06, 81/00*

U.S. Cl. 57—15 **3 Claims**



Apparatus for wrapping a conductor bundle with at least one tape comprising at least one pair of synchronously operable parallel rollers which are displaceable relatively to each other in a direction perpendicular to their axes in order to

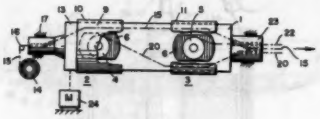
clamp a conductor bundle between them, and at least one wind-off roll for a tape which is so arranged that it is rotatable both about the conductor bundle and about its own axis. The conductor bundle may also be clamped between a pair of spaced-apart pressing means which are mutually displaceable in the direction of the roller axes, the confronting surfaces of these pressing means being outwardly curved.

3,636,692

HIGH-SPEED WIRE-STRANDING MACHINE

Dietrich Berges, Marienheide, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Apr. 27, 1970, Ser. No. 32,040
Claims priority, application Germany, May 3, 1969, P 19 22 745.3
Int. Cl. D07b *3/04*
U.S. Cl. 57—58.3 **6 Claims**



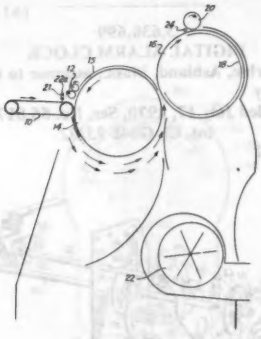
A high-speed wire-stranding machine with a low-noise factor in which the rotor comprising a cylindrical framework is equipped with one or more axially slidable sleeves or closure members adapted to enclose the openings required in the periphery of the rotor for exchanging one or more feed spools mounted within the cylindrical framework, preferably with locking means to hold said sleeves or closure members in their closed position during operation of the machine.

3,636,693

METHOD AND APPARATUS FOR FORMING YARN

William Benson, Fallowfield, and Gordon Short, Didsbury, both of England, assignors to The Cotton Silk and Man-Made Fibres Research Association

Filed Jan. 16, 1969, Ser. No. 791,723
Claims priority, application Great Britain, Jan. 16, 1968, 2,239/68
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.95 **18 Claims**



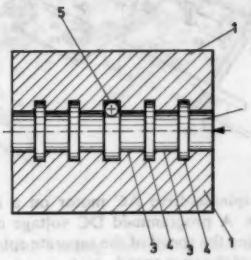
This invention comprises methods of and apparatus for making a yarn or like fiber assembly by twisting fibrous material together while reducing the extent to which individual fibers are twisted about their own axes. This is achieved by causing the fibers to roll about each other rather than be twisted as a bundle as in conventional spinning process for making textile yarn.

3,636,694

APPARATUS AND PROCESS FOR TANGLING FIBERS AND FILAMENTS

Wilhelm Pfunder, Denzlingen, and Gunter Schmidt, Emmendingen, both of Germany, assignors to Rhodiaceta AG, Freiburg im Breisgau, Germany

Filed May 15, 1969, Ser. No. 824,805
Claims priority, application Germany, May 18, 1968, P 17 60 454.5
Int. Cl. D02g *1/16*
U.S. Cl. 57—77.3 **17 Claims**



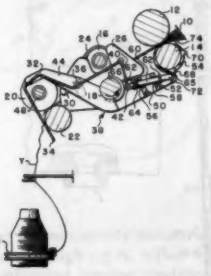
A loose bundle of fibers is passed through a new nozzle, characterized by a conduit provided with at least two slots and means for directing a fluid, for instance air, tangentially to the conduit for the fibers. Part of the fibers becomes transversely arranged over the remainder of the fibers giving a strong wound-up unit, which cannot be spread apart. Fixed points at regular intervals are obtained.

3,636,695

ROVING STOP

Robert M. Ingham, Jr., Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 13, 1969, Ser. No. 865,786
Int. Cl. D01h *13/18*
U.S. Cl. 57—84 **13 Claims**



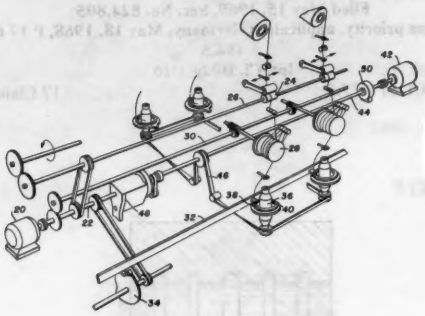
Apparatus to detect the breakage of a yarn end, commonly called an ends down, in a fiber handling system and in response to the detection actuate a release means to rotate the roving stop into the path of travel of the roving being supplied into the fiber handling system.

3,636,696

PROGRAMMED DRIVE SYSTEMS FOR DRAWTWISTERS

Frederick J. Howe, and Mario E. Jimenez, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 22, 1970, Ser. No. 4,874
Int. Cl. D01h *13/02*
U.S. Cl. 57—95 7 Claims



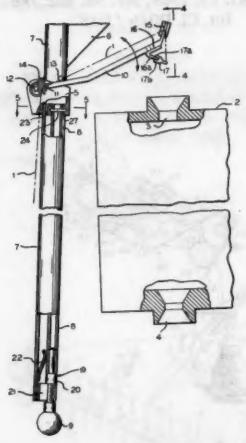
A separate spindle-drive AC motor on a drawtwister or spinning frame. A programmed DC voltage controls an inverter for varying the speed of the separate spindle AC motor independently of the yarn speed.

3,636,697

COMBINED THREAD-GUIDE AND THREADING DEVICE

Heinz Treptow, Ennepetal-Milspe, and Karl Bauer, Remscheid-Lennep, both of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Dec. 22, 1969, Ser. No. 886,883
Claims priority, application Germany, Dec. 27, 1968, P 18 17 084.8
Int. Cl. D01h *13/04*; D02j *13/00*
U.S. Cl. 57—106 8 Claims



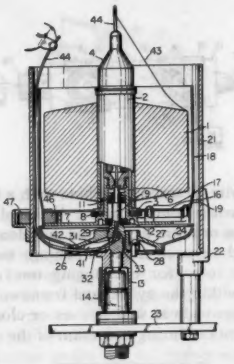
Combined thread-guide and threading device for heating chambers in textile machines, in particular in false-twist crimping machines, embodying a staff with a rod for moving a slidable head, which carries a pivotable arm held by a spring in steeply inclined position. The arm strikes a stop on reaching its highest position, in which process it tips out of its initial steep position into a less steep position. On the free end of the arm a holding device for a weight, which is fastened to a thread, holds the weight securely in the steeply inclined position of the arm and casts it off into a heating chamber in the less steep or castoff position of the arm.

3,636,698

METHOD OF THREADING A TWO-FOR-ONE YARN TWISTER

Teiji Nakahara, and Hideo Yanobu, both of Kyoto-shi, Japan, assignors to Murata Machinery, Ltd., Kyoto, Japan

Filed June 6, 1969, Ser. No. 831,054
Claims priority, application Japan, June 8, 1968, 43/39559
Int. Cl. D01h *1/10*; B65h *51/00*
U.S. Cl. 57—156 2 Claims



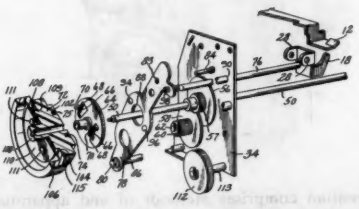
In a two-for-one yarn twister, a specially shaped yarn guide path is formed radially extending from a central longitudinal aperture of a spindle to a peripheral yarn guide of a storage disc. Further, a successive yarn guide path from the peripheral yarn guide towards an upper yarn guide member is given as a clearance between an inside and outside balloon limiting mantle. Initial yarn guiding is performed by firstly tying a leading end of a yarn drawn out of a package to a trailing end of a flexible yarn conductor, next, inserting a leading end of the conductor successively into a central aperture of an upper tension device of the twister.

3,636,699

DIGITAL ALARM CLOCK

Chester B. Marble, Ashland, Mass., assignor to General Electric Company

Filed July 17, 1970, Ser. No. 55,817
Int. Cl. G04b *23/02*
U.S. Cl. 58—22 10 Claims



A digital alarm clock wherein an alarm mechanism is provided at the sides of the digital clock numerals. An elongated

longitudinally moveable rod **76** extends from an electric motor **5** on one side of the digital alarm clock to an alarm cam mechanism **64–72** on the other side of the digital alarm clock for translating motion from one side to the other side of the clock.

3,636,700

WATCH WITH STOPWATCH HAND

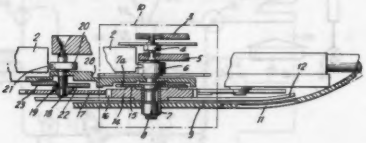
Ewald Stemmler, Ispringen, Germany, assignor to Durowe G.m.b.H., Pforzheim, Germany

Continuation-in-part of application Ser. No. 758,265, Sept. 9, 1968, now abandoned. This application June 10, 1970, Ser. No. 44,949

Claims priority, application Germany, Jan. 13, 1968, P 16 73 825.3

Int. Cl. G04f *7/04*

U.S. Cl. 58—74 **1 Claim**



This invention covers a watch which has a normally synchronized stopwatch hand and which is improved in that the transmission ratio between the minute hand and the stopwatch hand can be easily changed. The stopwatch hand may consist of a disk, a second hand may be provided which is coaxial with the minute hand, a self-winding mechanism may be incorporated in the watch, these improvements being made possible without requiring an increase in the thickness of the watch movement. The stopwatch hand is thus normally arranged to rotate in synchronism with the minute arbor and stopwatch hand setting means are mounted in the mounting structure and operable to rotate the stopwatch hand to a zero position and to hold it there until the hand is to be released.

3,636,701

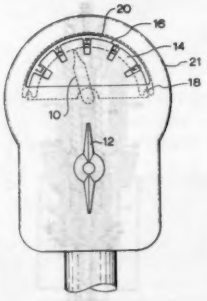
PARKING METER MASK

Boris Lazarow, 188 Betty Ann Drive, Willowdale, 444 Ontario, Canada

Filed May 21, 1970, Ser. No. 39,436

Int. Cl. G07c *1/30*

U.S. Cl. 58—141 **3 Claims**



Masking plates applied to a conventional meter obscure the indicator position except at predetermined time intervals.

3,636,702

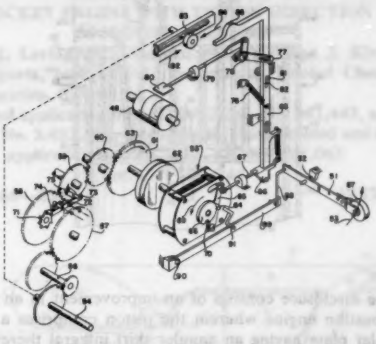
SLACK BELT ROTATION SENSOR

Fredrick T. Gutmann, Caldwell, N.J., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Feb. 4, 1970, Ser. No. 8,516

Int. Cl. G04b *5/20;* **G01d** *9/00;* **G06c** *23/02*

U.S. Cl. 58—145 R **4 Claims**



A shaft rotation sensing device wherein an idler shaft is coupled to an input shaft through a flexible belt. Friction bearing means provide a low level of resistance rotation of the idler shaft for maintaining one segment of the belt taut under constant speed conditions while a flywheel coupled to the idler shaft through a lost motion connection responds to shaft acceleration for tensioning the belt segment and shaft deceleration for slackening the belt segment. Lateral displacement of belt is detected for sensing shaft rotation. Combined with a clockwork mechanism, the rotation sensor forms part of an antitheft device for computing registers.

3,636,703

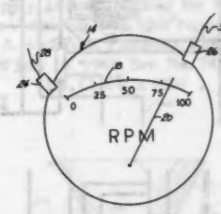
ENGINE PERFORMANCE INSTRUMENT

Douglas K. Dileski, 418 College Ave., Holland, Mich.

Filed Oct. 7, 1965, Ser. No. 493,654

Int. Cl. G07c *3/02;* **G01m** *15/00*

U.S. Cl. 58—146 **9 Claims**



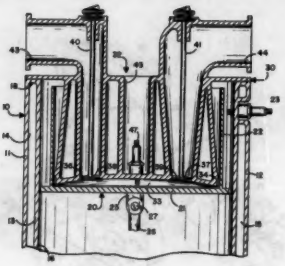
An instrument for accurately measuring the elapsed time between a low and a high r.p.m. value which is required for an internal combustion engine undergoing maximum acceleration, comprised of a tachometer for monitoring the engine speed, electrical pickoffs connected to the tachometer to provide a triggering output signal at a selected low and a selected high engine speed, and an electrically triggered timer coupled to the pickoffs to be turned on and off by the first and second pickoff signals, to thereby measure the elapsed time between receipt of the same.

3,636,704

INTERNAL COMBUSTION ENGINE

Arthur H. Featherstone, 2895 Scenic View Road, Alpine, Calif.

Filed Nov. 5, 1970, Ser. No. 87,229
Int. Cl. F02f 9/00; F01p 3/02; F02b 41/06
U.S. Cl. 60—15 4 Claims



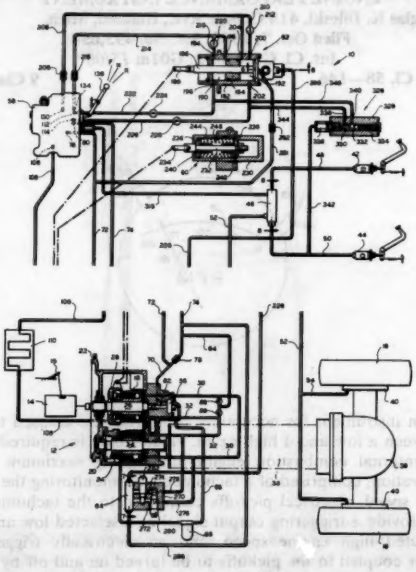
The disclosure consists of an improvement in an internal combustion engine wherein the piston comprises a disc or circular plate having an annular skirt integral therewith extending upwardly and being spaced from the peripheral edges of the disc and reciprocating in an enclosed cylinder wherein the upper head of the cylinder comprises a downwardly extending circular projection, and means in said cylinder, exteriorly of said annular skirt adapted to cause combustion of blowby gases.

3,636,705

AUTOMATIC CONTROL SYSTEM FOR HYDROSTATIC DRIVE

Wayne R. Howard, and Ronald L. Sisson, both of Jackson, Mich., assignors to Clark Equipment Company

Filed Sept. 14, 1970, Ser. No. 71,704
Int. Cl. F02b 41/00; F15b 15/18
U.S. Cl. 60—19 22 Claims



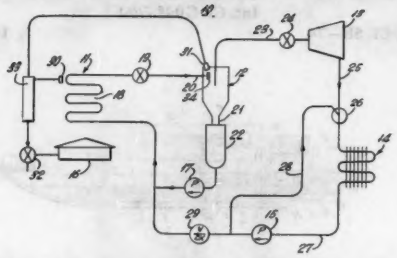
An automatic control system for use with a hydrostatic drive having a variable displacement fluid pump drivingly connected to an engine. The control system includes a spring mechanism connected to the pump for returning the pump to its zero displacement position and mechanism connected to the pump and responsive to engine speed for actuating the pump away from its zero displacement position.

3,636,706

HEAT-TO-POWER CONVERSION METHOD AND APPARATUS

Wallace L. Minto, Sarasota, Fla., assignor to Kinetics Corporation, Sarasota, Fla.

Filed Sept. 10, 1969, Ser. No. 856,729
Int. Cl. F01k 25/04
U.S. Cl. 60—36 9 Claims



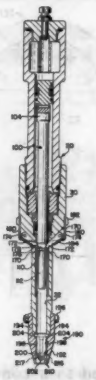
A fluorocarbon compound possessing a low-specific heat and a low-latent heat of vaporization is forced in the liquid state through a heat exchanger and heated to within 50° F. of, but not exceeding its critical temperature, while being maintained at a pressure exceeding its vapor pressure, to produce a liquid containing vaporous nuclei which is then injected through a nozzle or other pressure-reducing device tangentially into an expansion chamber, which chamber is at a pressure below the liquids' vapor pressure, whereby a portion of the liquid evaporates and separates from the remaining liquid. The vapor fraction is withdrawn from the chamber to drive a vapor engine, the engine's exhaust vapor is condensed to a liquid which is then raised in pressure and mixed with the liquid fraction from the separation chamber and recirculated through the heat exchanger.

3,636,707

POWER DEVICE

Oliver E. Saari, Niles, and Henry Pomernacki, Northbrook, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed July 22, 1970, Ser. No. 57,247
Int. Cl. F15b 1/02
U.S. Cl. 60—51 12 Claims



A pressure fluid power device for operating handtools having a power reservoir in which a compressible fluid, such as a

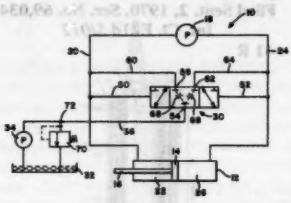
gas, is maintained under pressure and is employed to impart movement to or actuate, a suitable driving means, such as a drive piston or hammer of a power handtool, through a linkage of a noncompressible driving fluid. The invention further relates to cooperable means for slowing or braking the movement of the drive piston as it approaches its fully extended position to minimize shocks to the body of the device; sealing means within the device; and automatic means for limiting the amount of retraction of the drive piston.

3,636,708

FLUID MAKEUP SYSTEM

Lawrence P. Karman, Waynesville, and Morris R. Klein, Worthington, both of Ohio, assignors to Scott Equipment Company, Dayton, Ohio

Filed Apr. 13, 1970, Ser. No. 27,828
Int. Cl. F15b *15/18, 11/08, 13/042*
U.S. Cl. 60—52 R **6 Claims**



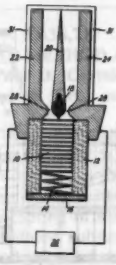
A closed-loop fluid makeup circuit is provided for a hydraulic piston system. A shuttle valve has an inlet and a pair of selectable outlets and is connected in parallel with the cylinder. A source of makeup fluid under pressure connected to the shuttle valve inlet. The shuttle valve has a spool positioned intermediate the inlet and outlets which is movable in response to the reversing pressure differentials between opposite sides of the cylinder to a first position during piston rod extension connecting the inlet with an outlet for adding makeup fluid to the circuit, and then to a second position during piston rod retraction connecting the inlet with an outlet for draining fluid from the circuit. A relief valve is connected between the shuttle valve and the makeup fluid source and permits the drained fluid to be expelled back to the source of recirculation.

3,636,709

PROPELLANT DEVICE

Aldo V. La Rocca, 214 Hardwicke Lane, Villanova, Pa.

Original application Dec. 13, 1967, Ser. No. 690,168. Divided and this application Oct. 10, 1969, Ser. No. 870,894
Int. Cl. F03h *5/00*
U.S. Cl. 60—203 **2 Claims**



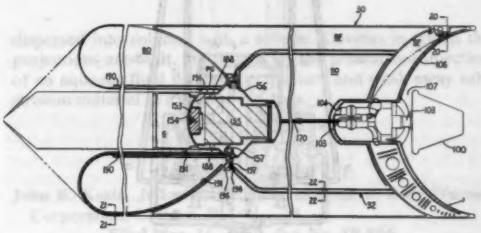
Discrete quantities of solid vaporizable propellant are provided as lamina of solid slug, fed by spring against insulating stop into interelectrode region where electrical discharge initially strikes down to lamina, gasifying it and then continues through gas, adding energy which causes ejection of gas with high momentum. Paschen's law causes discharges to take long path down to lamina until its complete gasification raises pressure sufficiently to permit the discharges to follow shorter path through gas. Lamina are separated by nonconductive layer; may be exothermically reactive to add thermal energy to gas.

3,636,710

ROCKET ENGINE WITH THRUST DIRECTION MODIFYING DEVICES

Joseph J. Lovingham, Madison, and Hartmann J. Kircher, III, Sparta, both of N.J., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Original application Dec. 18, 1962, Ser. No. 247,443, now Patent No. 3,482,404, dated Dec. 9, 1969. Divided and this application Oct. 22, 1965, Ser. No. 501,063
Int. Cl. F02k *1/14*
U.S. Cl. 60—231 **17 Claims**



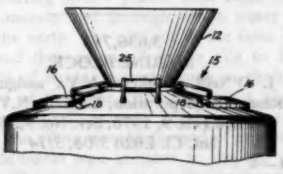
1. A rocket engine comprising, in combination, a manifold for introducing propellants into a combustion chamber, a wall having a hemispherical deflecting surface fixed to an intermediate portion of said manifold and extending aft therearound, a conical combustion chamber fixed to and communicating with the aft end of said manifold and having its larger open end positioned adjacent but spaced from said surface to define an expansion exhaust nozzle and throat therewith, apertures formed in the apex of said chamber for bleeding combustion gases therethrough, and means for deflecting a portion of said gases to vary the thrust vector of said engine in operation.

3,636,711

SOLID PROPELLANT ROCKET MOTOR

T. O. Paine, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Floyd A. Anderson, Pasadena, Calif.

Filed July 16, 1968, Ser. No. 745,337
Int. Cl. F02k *9/04*
U.S. Cl. 60—254 **2 Claims**



A solid propellant rocket motor is provided with a venting system, which is used to control the motor's effective nozzle throat area. By controlling the nozzle throat area the ratio of the motor's ratio of free chamber volume to nozzle throat area is controlled, thereby controlling the motor's com-

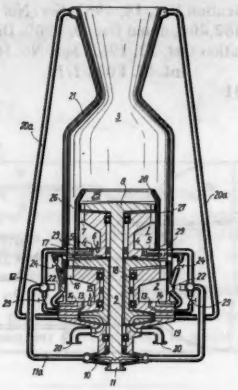
bustion extinction pressure, the value of which determines whether the motor is in a stable or unstable combustion zone.

3,636,712

LIQUID ROCKET ENGINE AND METHOD OF OPERATING SAME

Michael Kaufmann, Neubiberg, Germany, assignor to Bolkaw Gesellschaft mit beschankter Haftung, Hamburg, Germany

Filed Dec. 21, 1964, Ser. No. 422,067
Claims priority, application Germany, Dec. 21, 1963, B 74767
Int. Cl. F02k 9/02
U.S. Cl. 60—260 **23 Claims**



1. In a liquid propellant rocket engine including ante-combustion chamber means, main combustion chamber means, means for supplying fuel and oxidizer to the ante-combustion chamber means for combustion therein, means for delivering the combustion gases from the ante-combustion chamber means to the main combustion chamber means, turbine means interposed in the path of the combustion gases being driven thereby, and feed pump means driven by the turbine means: the improvement comprising, in combination, at least one first ante-combustion chamber positioned in advance of said main combustion chamber means; at least one second ante-combustion chamber positioned in advance of said main combustion chamber means; means for supplying fuel and an excess of oxidizer to each first ante-combustion chamber for combustion therein under excess oxidizer condition; means for supplying oxidizer and an excess of fuel to each second ante-combustion chamber for combustion therein under excess fuel conditions; and means for delivering the combustion gases from said first ante-combustion chambers to said main combustion chamber means separately from delivery of the combustion gases from said second ante-combustion chambers to said main combustion chamber means.

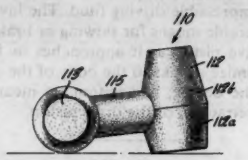
3,636,713

MARINE BLOCK

Raymond J. O'Neill, Yonkers, N.Y., assignor to Gratten Marine Research Corporation, Yonkers, N.Y.

Filed Feb. 9, 1970, Ser. No. 9,558
Int. Cl. E02b 3/08, 3/14
U.S. Cl. 61—4 **12 Claims**

A marine block useable with other similar marine blocks in constructing marine structures such as groins, breakwaters, seawalls and seawall armor. The blocks are used in constructing structures in an arranged condition in which they are keyed together and may be disposed in a random arrangement. Each block is constructed as two massive, end cylinders of circular cross section joined together integrally by a center cylinder of lesser mass and diameter than the end cylinders. The end cylinders are arranged at 90° to each



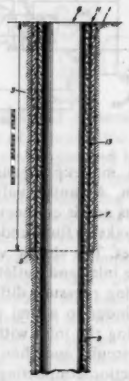
other so that one constitutes a horizontal cylinder and the other a vertical or upstanding cylinder.

3,636,714

WATERPROOF SHAFT AND METHOD OF FORMING SAME

Maurice G. Korol, and Thomas H. Holley, both of Omaha, Nebr., assignors to Peter Kiewit Sons' Co., Omaha, Nebr.

Filed Sept. 2, 1970, Ser. No. 69,034
Int. Cl. E21d 5/012
U.S. Cl. 61—41 R **7 Claims**



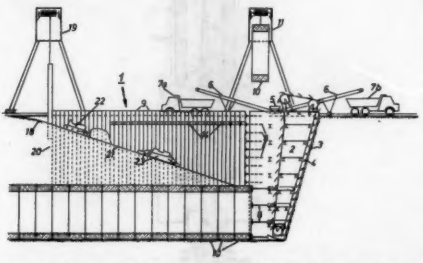
An excavated mine shaft being provided with inner and outer concrete liners extending the depth of any water-bearing strata through which the shaft extends, and a barrier positioned between said inner and outer concrete liners and being impervious to moisture and expansible upon being subjected to moisture, and the method of forming the same waterproof mine shaft.

3,636,715

METHOD OF AND MACHINE FOR ERECTING LONG STRAGGLING SUBTERRANEOUS BUILDINGS

Johann Morner, Kurf 7, 8207 Endorf, Germany

Filed Aug. 1, 1968, Ser. No. 749,384
Int. Cl. E02f 5/06
U.S. Cl. 61—41 **6 Claims**



Proposed is a method of erecting long straggling subterraneous buildings within an open ditch, comprising the steps

of excavating the earth at the end face of the ditch by means of a digging machine which is advanced substantially continuously, supporting the lateral walls of the ditch in the region adjacent the end face by prop pieces which are moved forward together with the digging machine, sectionwise building-in the building from prefabricated parts directly behind the digging machine in the free space between the prop pieces at the bottom of the ditch, supporting the lateral walls of the ditch in a region located behind the prop pieces, and subsequently filling the ditch again over the building.

3,636,716

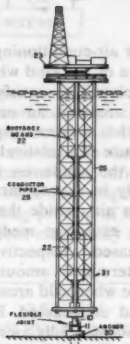
SWIVEL JOINT CONNECTION

Leopold J. Castellanos, Houston, Tex., assignor to Esso Production Research Company

Filed Mar. 30, 1970, Ser. No. 23,663

Int. Cl. E02b *17/00;* **B63b** *35/44;* **F16d** *3/16*

U.S. Cl. 61—46.5 **5 Claims**



A swivel joint for use in a buoyant articulated offshore platform. Two U-shaped interlocking links, each having a contact surface formed on the intermediate section connecting the two parallel extending sides, are oriented at 90° to each other. A plate is positioned between the two contact surfaces and the surfaces of the U-shaped links bear against a contact surface on each side of the plate when tensile forces are applied in opposite directions to the links. At least one of each of the contact surfaces bearing against each other is curved. The disposition of the curved bearing surfaces permits one of the links to rock against the intermediate plate in one plane whereas the other link can rock in a plane at 90° to the one plane. This arrangement permits the outer end of one link to swing in any direction with respect to the outer end of the mating link.

3,636,717

PILE ANCHORING METHOD AND APPARATUS

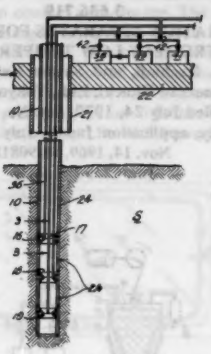
Ivo C. Pogonowski; Paul D. Carmichael, and Richard H. Griswold, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,429

Int. Cl. E02d *5/54*

U.S. Cl. 61—53.68 **3 Claims**

The invention relates to a method and the apparatus therefor for the pile anchoring of a structure in a relatively shallow or underconsolidated substratum. The method includes the initial introduction of an anchoring pile to a desired depth into the normally incompetent substratum. A series of longitudinally spaced peripheral projections are then formed in the substratum adjacent the pile external wall, at discrete intervals to define an irregular holding surface on the otherwise uniform sided pile. The annular projections comprise a precipitated mass of a polymerized methacrylate that has been introduced as a liquid through the pile,



dispersed into solution with a solvent. Cavities in which the projections are built, are formed by the pressurized injection of an aqueous fluid whereby to displace and wash away substratum material in a desired pattern.

3,636,718

WATER JETTED PILING

John B. Keats, Jeffersonville, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 16, 1970, Ser. No. 19,566

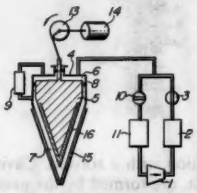
Int. Cl. E02b *5/32, 7/24*

U.S. Cl. 61—53.74 **4 Claims**

A pile and method of sinking piling into clay, sand or other material (which may be underwater) is disclosed employing a downward pointing hollow plastic nose cone base which is filled with concrete and through which water is jetted to erode away the earth. The exterior of the cone is broken by threads formed thereon to allow the pile to be advanced through strata of harder material such as shell layers. The upper surface of the nose cone includes a series of stair-stepped cylindrical flanges to receive different diameter plastic pipe. The piling may be formed of any height desired by adding additional pipe sections to the top of the initial pipe sections. The pipe sections are also preferably filled with concrete which may be reinforced by a spiral steel reinforcement rod. In assembling, the lightweight plastic members are solvent welded together at the site, concrete is poured into the nose cone about a central jetting pipe and the unit lowered to the earth. Then by either jet action or screw action or both, the piling is advanced into the earth to the

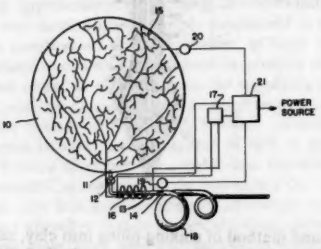
desired depth. Additional pipe segments are added as needed as the piling drops further into the ground. Steel reinforcing rods and concrete are then added if desired.

3,636,719
REFRIGERATION APPARATUS FOR DEVELOPING EXTREMELY LOW TEMPERATURES
Shintaro Sato, Hachioji, and Shigeo Kato, Mitaka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed July 24, 1970, Ser. No. 57,954
Claims priority, application Japan, July 29, 1969, 44/59328; Nov. 14, 1969, 44/90818
Int. Cl. F25b 9/00
U.S. Cl. 62—6 **3 Claims**



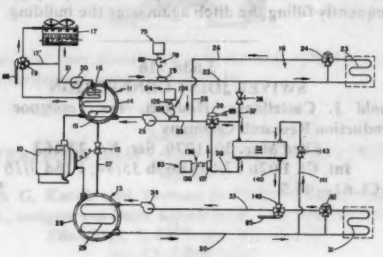
A refrigeration apparatus of the type with which gas is subjected to adiabatic expansion for the production of cold in an expansion chamber defined by a cylinder and a displacer or a piston, wherein the portions of the cylinder and displacer or piston defining the expansion chamber have complementary conical shapes and at least one of the cylinder and the displacer or the piston is arranged to function as a regenerator having a good heat transfer rate and a large specific heat.

3,636,720
PHASE SEPARATOR
Walter F. Krieve, Palos Verdes Peninsula, Calif., assignor to TRW, Inc., Redondo Beach, Calif.
Filed Apr. 30, 1969, Ser. No. 820,589
Int. Cl. F17c 9/02
U.S. Cl. 62—49 **1 Claim**



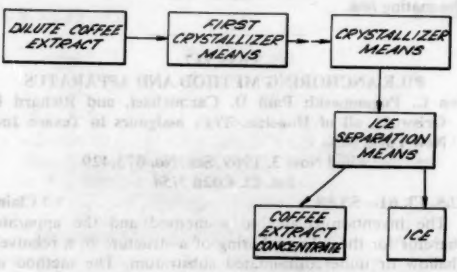
A fluid phase separator is provided which controls the mass flow rate of a fluid being expelled from a tank and insures that the fluid is in a vapor phase. A control valve is attached to the tank. Connected to the control valve is a flow tube which is sized such that the mass flow rate of the fluid passing through the tube is substantially independent of the phase of the fluid entering. The tube is designed to have flow characteristics and sufficient heat transfer area such that the fluid exiting is in a vapor phase. A ballast chamber is connected to the flow tube. The chamber delivers vapor from the flow tube and damps the effects of pressure response in the fluid. A pressure sensor is placed at the downstream end of the ballast tube for control of the valve. The fluid phase separator is applicable for use as a feed system in a low or zero-gravity field which uses a fluid having an appreciable vapor pressure when stored as a liquid such as ammonia, oxygen, or hydrogen.

3,636,721
CONTROL SYSTEM FOR AIR-CONDITIONING EQUIPMENT
Harland E. Rex, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 3, 1969, Ser. No. 873,424
Int. Cl. F25d 17/02
U.S. Cl. 62—98 **8 Claims**



A control system for air-conditioning equipment including a refrigeration machine of the kind wherein heat rejected in the condenser is employed to satisfy a demand for heat within a plurality of areas in an enclosure wherein said refrigeration machine has a normal operating characteristic such that the temperature of a relatively warm heat exchange medium passing from the condenser to the areas requiring heating varies inversely in a predetermined relationship to the temperature of the air outside the enclosure. The temperature of said heat exchange medium is selectively increased and decreased respectively upwardly and downwardly a predetermined amount from said normal operating characteristic when said areas are respectively substantially occupied and unoccupied. Excess heat produced when the areas are substantially occupied is stored until required to satisfy the heating requirement in areas in the enclosure when said areas are substantially unoccupied. After sufficient heat is stored, the temperature of said heat exchange medium is decreased until it reaches its predetermined normal operating point related to outdoor temperature.

3,636,722
CONCENTRATION OF COFFEE
Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Patent Corporation, Huntsville, Tex.
Original application July 6, 1967, Ser. No. 651,451, now abandoned. Divided and this application Nov. 25, 1969, Ser. No. 879,843
Int. Cl. A23l 1/06
U.S. Cl. 62—123 **2 Claims**



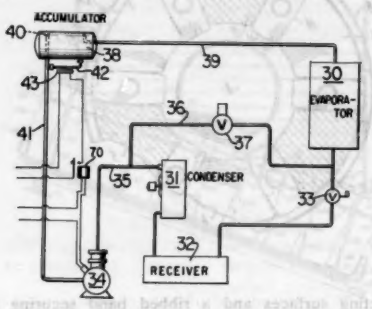
In a system for the freeze concentration of coffee, the ratio of the area of the heat transfer surfaces of the crystallizer to the volume of the crystallizer should be between 7:1 to 10:1. To accomplish this ratio, a crystallizer having both a jacket and a central passage for refrigerant may be used.

3,636,723

REFRIGERATION SYSTEM WITH SUCTION LINE ACCUMULATOR

Daniel E. Kramer, Yardley, Pa., assignor to Kramer Trenton Company, Trenton, N.J.

Filed Sept. 17, 1969, Ser. No. 858,749
Int. Cl. F25b *43/02*
U.S. Cl. 62—197 5 Claims



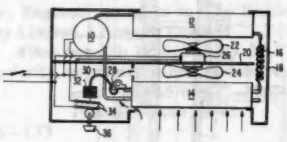
A refrigerant accumulator in the suction line of a closed refrigeration system, provided with a controllably heated metering tube between the bottom of the accumulator and a downstream point in the suction line, to ensure at least adequate reevaporation of the refrigerant, to eliminate slugging and to return oil to the compressor, particularly during the hot gas defrosting portion of the refrigeration cycle, the heating being effected electrically or by means of hot gas from the compressor.

3,636,724

COMBINED AIR AND EVAPORATOR TEMPERATURE CONTROL MEANS FOR AIR CONDITIONER APPARATUS

Harry F. Moy, San Antonio, Tex., assignor to Friedrich Refrigerators Incorporated, San Antonio, Tex.

Filed May 18, 1970, Ser. No. 38,190
Int. Cl. F25b *1/00*
U.S. Cl. 62—215 3 Claims



In an air-conditioning apparatus, a single temperature sensor is used to control both room temperature and to prevent evaporator icing by mounting the sensor in heat conducting relation to the evaporator and in a path of airflow which parallels but bypasses the main stream of air through the evaporator.

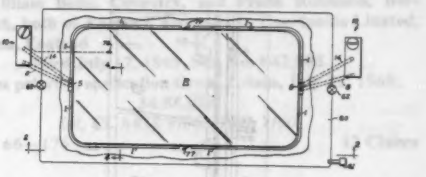
3,636,725

APPARATUS FOR PREPARING AND MAINTAINING ICE SKATING RINKS

Calvin D. MacCracken, Englewood, N.J., assignor to Calmac Manufacturing Corporation, Englewood, N.J.

Original application Dec. 24, 1968, Ser. No. 786,603, Pat No. 3,495,415, which is a continuation-in-part of application Ser. No. 561,308, June 9, 1966, now abandoned. Divided and this application Dec. 2, 1969, Ser. No. 881,474
Int. Cl. A63c *19/10*
U.S. Cl. 62—235 10 Claims

An apparatus for preparing and maintaining ice skating rinks in which air is refrigerated to a temperature in the range below 10° F. and preferably below 5° F. and above a lower limit of approximately 0° F. and is supplied at a low velocity from multiple outlets spaced around the major portion of the periphery of the skating area at a level closely adjacent to the surface of the ice to create an abruptly stratified blanket of cold air in contact with the ice. The velocity of the refrigerated air discharged from these outlets onto the ice is held to a low level which in one successful embodiment is about 5.0 feet per second to avoid the entrainment of ambient air from above, and the return air is drawn from a level below 8 inches and preferably below 6 inches above the surface of the built-up ice, so as to be withdrawn from the blanket mass thus maintaining an abruptly stratified blanket of cold air of low-moisture content in contact with the ice. It is not necessary to shave the ice to keep it less than 1 to 1½ inches thick, as is required in conventional rinks using subfloor piping grid refrigerating systems, and in fact the ice is allowed to build up to a thickness of at least 3 inches and preferably in the range from 3 to 8 inches thick. Conveniently portable modular dasher boards are interconnected to form the rink and layout the supply ducts and grilles for the refrigerated air. A special air-refrigerating coil and moisture-removing arrangement is disclosed, and an air-supported enclosure may be used to house the rink.

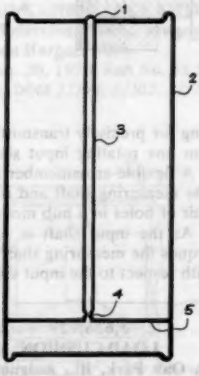


3,636,726

METHOD OF COOLING CONTAINERS

Nathan Rosenfeld, Unit 11, 459 Old South Head Road, Rose Bay, New South Wales, and Stuart Frederick Fox, 47 Lamrock Ave., Bondi Beach, New South Wales, 2026, both of Australia

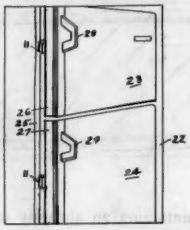
Filed Aug. 26, 1969, Ser. No. 853,007
Claims priority, application Australia, Aug. 30, 1968, 42817/68
Int. Cl. F25d *3/10*
U.S. Cl. 62—294 7 Claims



A container of beverage is conveniently cooled by the provision of a small reservoir of a compressed nontoxic gas or nontoxic liquid in the interior of the beverage. The beverage is rapidly cooled when the gas is allowed to escape

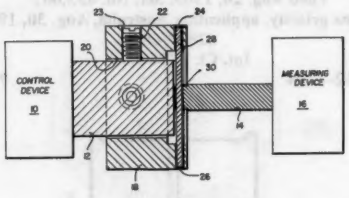
from the reservoir through a throttle, the device being generally in the form of a flat plate in the interior of the beverage.

3,636,727
DOOR STOP
James Gordon Naughton, Erie, Pa., assignor to Frank C. Endean, Jr., Erie, Pa.
Filed Sept. 24, 1969, Ser. No. 860,543
Int. Cl. F25d *17/04*
U.S. Cl. 62—409 **1 Claim**



A stop for a door especially a refrigerator door which is made up of a block of rigid and/or resilient material with a magnet supported in one side of it, the material being of such weight that it can be supported by magnetic force. The magnet holds the block to a doorjamb in the path of the swinging door. Thus, the door is retained open a crack for ventilation and for other purposes.

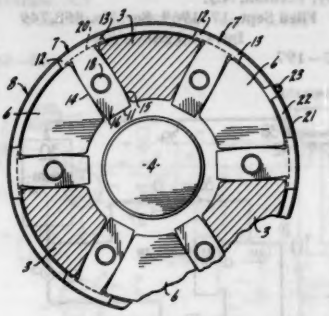
3,636,728
SHAFT COUPLING
Ralph E. Walker, Los Angeles, Calif., assignor to Litton Precision Products, Inc., Beverly Hills, Calif.
Filed Mar. 20, 1970, Ser. No. 21,372
Int. Cl. F16d *3/16*
U.S. Cl. 64—11 R **6 Claims**



A shaft coupling for precisely transmitting angular motion and position from one rotating input shaft to an eccentric measuring shaft. A flexible crossmember is radially mounted on one end of the measuring shaft and is held in sliding engagement in a pair of holes in a hub mounted on one end of the input shaft. As the input shaft is rotated, the flexible crossmember torques the measuring shaft at a constant rotational velocity with respect to the input shaft.

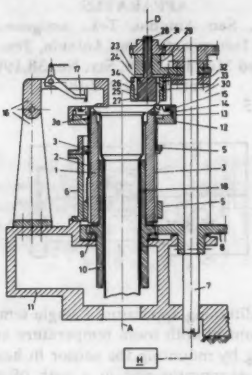
3,636,729
LOAD CUSHION
Raman A. Patel, Oak Park, Ill., assignor to Lovejoy, Inc., River Forest, Ill.
Filed Jan. 30, 1970, Ser. No. 7,163
Int. Cl. F16d *3/64*
U.S. Cl. 64—14 **2 Claims**

A meshing jaws-type flexible coupling and an individual cushion between each adjacent pair of jaws, the cushion having retaining shoulders limiting inward radial movement of the cushion, axially directed spring projections and convex



jaw-contacting surfaces and a ribbed band securing the cushions in place.

3,636,730
TEXTILE MESH AND METHOD AND APPARATUS FOR ITS MANUFACTURE
Josef Fecker, Freudenstadt, Wurtteberg, Germany, assignor to Tex-patent GmbH, Fribourg, Switzerland
Filed Oct. 13, 1969, Ser. No. 865,620
Claims priority, application Germany, Nov. 26, 1968, P 18 11 053.7
Int. Cl. D04b *15/02*
U.S. Cl. 66—95 **7 Claims**



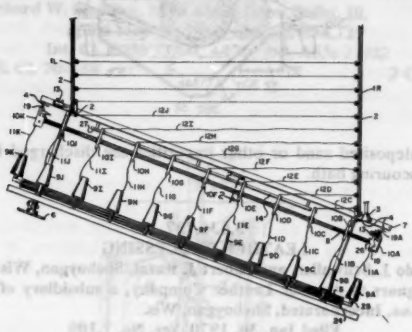
This invention relates to a method and a circular knitting machine for manufacturing textile mesh products, particularly in the form of stockings and stocking tights, wherein a loop is transferred from one wale into an adjacent wale to prevent the formation of ladders. The transferred loop is moved laterally past an adjacent needle, whereupon the head of the needle is then lowered to engage one of the flanks of the transferred loop to move same downwardly. The transferred loop is then further moved laterally relative to the adjacent needle to cause the other flank of the transferred loop to pass over the head of the needle, thereby causing the plane of the loop to be rotated approximately 180°. The transfer element is then disengaged from the transferred loop, whereby the twisted transferred loop remains engaged with the adjacent needles.

3,636,731

TENSION-RELAXING DEVICE FOR FEEDING FILLING THREADS TO A WARP KNITTING MACHINE

Robert F. Jones, 9C Colonial Drive, Little Falls, N.J.

Filed Aug. 4, 1970, Ser. No. 60,875
Int. Cl. D04b 23/12
U.S. Cl. 66—84 4 Claims



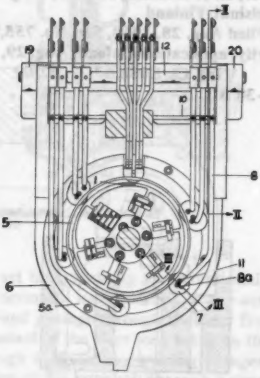
In a multiple-package filling-thread-feeding device for warp knitting machines of the so-called "carousel" type in which thread from a plurality of packages which are moved around by an endless chain is fed to transfer chains provided with pins which carry the filling or weft threads to the knitting line, the motion of the packages stretches successive filling thread lengths from the pins on one chain to the pin on the other. These threads each pass through a tension device between two spring-pressed discs, the tension device for each package moving with it. On the warp knitting machine frame is a cam somewhat shorter than the distance between chains, which cam contacts a rod or follower in each tension device and spreads the discs apart by a wedge at one end while the filling thread is fed out from each package, tension being renewed for a short distance at either end of the length of filling thread from chain to chain.

3,636,732

YARN-FEEDING MEANS FOR KNITTING MACHINES

Keith Gerald Townsend, and David Arthur Harlow, both of Leicester, England, assignors to The Bentley Engineering Company Limited, Leicester, England

Filed Apr. 20, 1970, Ser. No. 30,175
Claims priority, application Great Britain, Apr. 23, 1969, 20,685/69
Int. Cl. D04b 15/48
U.S. Cl. 66—133 13 Claims



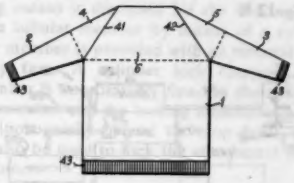
A circular knitting machine is provided with a yarn feeder to be positioned in the neighborhood of the needle circle, and an arm carrying the yarn feeder pivoted at a distance from the needle circle for movement to bring the yarn feeder into and out of an active yarn-feeding position, and locating means to restrain the yarn feeder against undesired movement when in active position. In a machine having a multiplicity of knitting stations, all the feeder arms are pivoted about a common axis and the yarn feeders having long arms are provided with each locating means in the vicinity of the needle circle.

3,636,733

KNITTING METHOD

Max William Betts, Coventry, and Frank Robinson, Borrowash, both of England, assignors to Courtaulds Limited, London, England

Filed July 17, 1969, Ser. No. 842,505
Claims priority, application Great Britain, July 22, 1968, 34,853/68
Int. Cl. A41b 9/06; D04b 7/00
U.S. Cl. 66—176 12 Claims



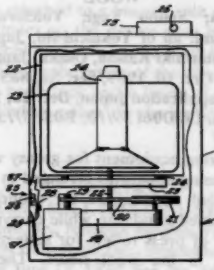
A method of knitting a sleeved garment on a knitting machine, the method including the steps of knitting a shoulder portion of each sleeve, in the direction towards the upper end of the sleeve, in reciprocatory manner on both beds of a pair of opposed beds of the machine so that pieces of the shoulder region on the two beds are joined together at an edge of the sleeve which is outermost in the finished garment, knitting the body of the garment commencing at the lower end and knitting front and rear upper body portions of the garment as flat fabric on different beds of a pair of opposed beds of the machine and joining the front and rear upper body portions to the shoulder portions of the sleeves, or vice versa, during knitting on the machine. A knitting machine for carrying out the method is also claimed.

3,636,734

WASHING MACHINE UNBALANCE SWITCH CIRCUIT

Edward H. Getz, Watervliet, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 20, 1970, Ser. No. 65,597
Int. Cl. D06f 23/04, 33/02, 37/24
U.S. Cl. 68—12 R 4 Claims



A washing machine unbalance switch circuit employs a solenoid coil connected in series with the drive motor and normally shunted by its own contacts which are actuated by a

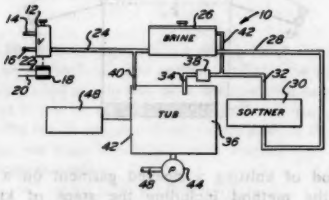
lever arm in response to excessive basket movement as may result from an unbalance load. The lever arm is magnetically latched upon opening of the shunt circuit and energization of the coil to maintain the coil as a series impedance in the motor circuit to stop and prevent operation of the motor. In one embodiment the solenoid coil is connected in series with the entire electrical control circuit of the machine to prevent further operation of the machine without first being attended by an operator. A second embodiment employs the solenoid coil in series with the drive motor but ineffective with respect to the remainder of the control circuit so that a presettable program timer remains operable to complete a preset cycle without first requiring the attention of an operator.

3,636,735

WATER-SOFTENING SYSTEM FOR WASHING MACHINES

Stuart Borochaner, Levittown, Pa., assignor to National Water Pure Corporation, Burlington, N.J.

Filed Aug. 22, 1969, Ser. No. 852,293
Int. Cl. B01d *15/06;* **D06f** *29/00*
U.S. Cl. 38—12 R **2 Claims**



A water-softening system for washing machines and the like which comprises a regeneration chamber in direct circuit between the water supply and an ion-exchange chamber which is, in turn, in direct circuit with the washing machine tub. Normally, there is no regeneration material in the regeneration chamber so that water flows directly through to the ion-exchange chamber, where it is softened, and then into the tub. When it is necessary to regenerate the ion-exchange resin, regeneration material, either granular or fluid, is inserted into the regeneration chamber and the water from the source is permitted to flow for a brief interval sufficient to carry the regeneration material into the ion-exchange chamber. It is permitted to stay in the ion-exchange chamber for sufficient time to regenerate the ion-exchange resin and is then flushed out through the tub into the drain. No special control valves or other control means are necessary for the regeneration cycle.

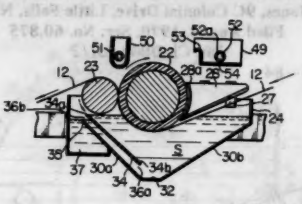
3,636,736

IMPROVED APPARATUS FOR SCOURING GREASY WOOL

Nobuo Terasawa; Syuho Yagi; Yoichiro Yanaga, and Toyotaro Kiritani, all of Yokaichi-shi, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Oct. 10, 1969, Ser. No. 865,356
Claims priority, application Japan, Dec. 28, 1968, 43/96102
Int. Cl. D06f *39/10;* **B05c** *3/138*
U.S. Cl. 68—18 F **9 Claims**

Improved scouring equipment for greasy wool includes an assembly of cleansing apparatus arranged in series. Each apparatus is provided with means for scouring greasy wool fibers in their opened condition while carrying in a scouring liquid and a pair of press rollers for squeezing the scouring liquid contained in the wool fibers. The used liquid is separated from the residue sand or other impurities deposited on the bottom of a scouring bath and discharged from an outlet of a separate passage formed along a sidewall of the scouring bath by being flowed upward from the bottom of the bath. The discharged scouring liquid is used in a similar way as that of the conventional scouring equipment, while



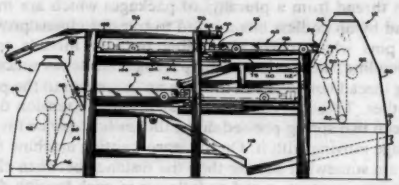
the deposited sand or other impurities are discharged from the scouring bath.

3,636,737

LEATHER PROCESSING

Lando J. Schwaller, and Albert J. Razal, Sheboygan, Wis., assignors to Armour Leather Company, a subsidiary of Akzona, Incorporated, Sheboygan, Wis.

Filed Jan. 30, 1970, Ser. No. 7,109
Int. Cl. C14b *1/06*
U.S. Cl. 69—42 **9 Claims**



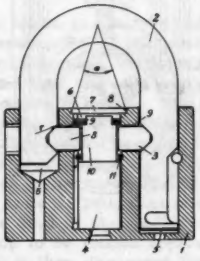
A method and apparatus for processing leather hides utilizing a generally conventional first processing apparatus adapted to continuously process one-half only of the area of a leather hide, wherein a second processing apparatus identical in function to the first apparatus is provided in tandem, and wherein a hide is processed by first processing one-half only of the area of the hide utilizing the first apparatus and conveying the hide to the second apparatus for processing the other half of the hide without necessitating manual end-to-end reversal of the hide.

3,636,738

PADLOCK

Valdemar Burakoff; Paul Krakstrom; Into Sinervo, and Kaarlo Solitanner, all of Helsinki, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

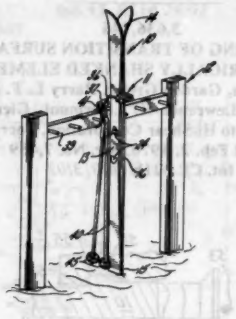
Filed Aug. 28, 1968, Ser. No. 755,969
Claims priority, application Finland, Aug. 29, 1967, 2315/67
Int. Cl. E05b *67/22, 67/02*
U.S. Cl. 70—38 A **13 Claims**



A padlock of hardened steel having a lock mechanism inserted through an opening in the lock casing, which opening

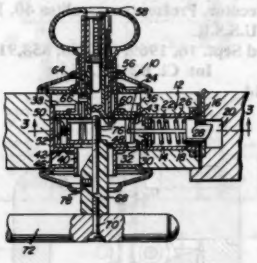
is covered by a cover plate with a very shallow surface hardening. The cover plate is initially curved and is pressed flat to fill a conical attachment recess in the lock casing.

3,636,739
LOCK FOR SKIS
Richard W. Smedley, 1008 Alann Drive, Joliet, Ill.
Filed May 13, 1969, Ser. No. 824,127
Int. Cl. E05b *73/00*; A47f *7/00*; A63c *11/02*
U.S. Cl. 70—58 3 Claims



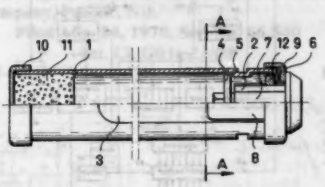
A lock is provided for a pair of skis, the lock having a shackle and mating body which define an enclosed free space of generally lateral cross section, the length of the cross section being less than the maximum width of the skis but greater than the minimum ski width, and the width of the cross section being less than twice the maximum thickness of a single ski, but greater than twice the minimum thickness of a single ski.

3,636,740
DOOR LOCK WITH PUSH ACTION CONTROL
Henry W. Rollins, 65 Burley St., Waterville, Maine
Continuation-in-part of application Ser. No. 606,796, Jan. 3, 1967, now Patent No. 3,490,803. This application Dec. 30, 1969, Ser. No. 889,267
Int. Cl. E05b *63/16, 65/10*; E05c *1/14*
U.S. Cl. 70—92 8 Claims



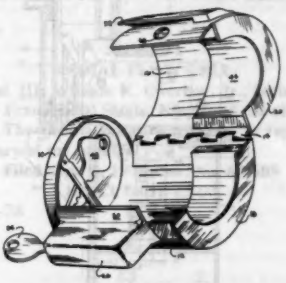
A door lock set incorporating a conventionally operating rotating knob, normally incorporating a key-actuated lock, for allowing limited passage through the door from the knob side thereof. Control of the door lock set from the other side is effected through a mounted camming plunger which can effect a retraction of the latchbolt through a simple push action, having an elongated panic bar attached thereto, or a push or rotating action of the plunger, the plunger in this instance mounting a knob thereon for the control thereof.

3,636,741
LOCKING MEANS
Paavo Enne, Matinkyla; Gustaf Gahmberg; Kurt Pousar, and Kaarlo Henrik Solitanner, all of Helsinki, all of Finland, assignors to Oy Wartsila AB, Helsinki, Finland
Filed Oct. 9, 1969, Ser. No. 865,001
Claims priority, application Finland, Oct. 9, 1968, 2846/68
Int. Cl. E05b *73/00*, F16b *41/00*
U.S. Cl. 70—230 2 Claims



A locking means is disclosed for the locking of the end portion of a tubular member by means of a cylinder lock. The tubular member is provided with an internal radially extending stop face. A cylinder lock carrying a rotatable locking member is nonrotatably fitted in the end opening of the tubular member and the locking member is turned into a locking position axially behind the stop face. The locking means can also be used to lock the attachment screws of an outboard motor.

3,636,742
LOCK-OUT KEY HOLDER
Gerrel B. Raney, Odessa, Tex., assignor to Filley Enterprises, Inc., Midland, Tex.
Filed May 22, 1970, Ser. No. 39,935
Int. Cl. E05b *17/14*
U.S. Cl. 70—424 9 Claims

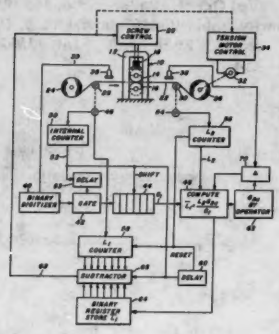


A solid disc is attached to a hinged, split cylinder. A lock is on one hemicylinder so the device may be secured over a door knob to shield the keyhole of a knob lock with the solid disc. A steel spring on the inside of the disc provides a holder for a key to the knob lock and a lining of sponge rubber inside the hemicylinders makes the device adaptable to several size knobs.

3,636,743
ROLLING MILL CONTROL SYSTEM
James B. Murtland, Jr., Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Brackenridge, Pa.
Filed June 15, 1970, Ser. No. 46,320
Int. Cl. B21b *37/12*
U.S. Cl. 72—9 9 Claims

A rolling mill control system based upon the constant volume principle and wherein strip length or velocity at the

entrance or exit side of the mill is compared with calculated strip length or velocity, to derive an error signal for the



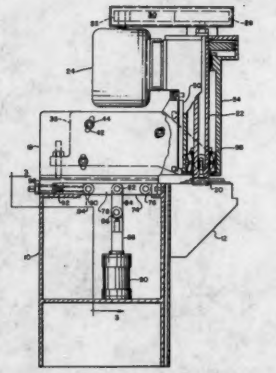
rolling mill screwdown and/or a tension regulating device to maintain output gage at a desired value.

3,636,744

INTERNAL GEAR ROLLING MACHINE

Carl H. Motz, Harper Woods; Richard W. Tersch, Grosse Pte. Woods, and Arthur B. Bassoff, Oak Park, all of Mich., assignors to Lear Siegler, Inc., Santa Monica, Mich.

Filed May 18, 1970, Ser. No. 38,455
Int. Cl. B21h *5/02*
U.S. Cl. 72—91 **10 Claims**



A machine for rolling the teeth of an internal gear comprising power means for moving a gearlike die radially of an internal gear to apply metal deforming pressure to its teeth.

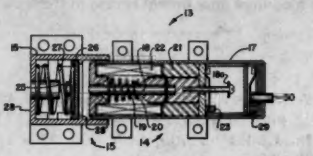
3,636,745

SAFETY LOCK FOR CAMPER DOORS

Gloyd W. Green, 2895 South State, Salt Lake City, Utah

Filed Mar. 5, 1970, Ser. No. 16,763
Int. Cl. E05b *47/02, 65/16*
U.S. Cl. 70—281 **8 Claims**

A safety lock device adapted to use on the door of a camper body. The device automatically locks and unlocks the camper door upon operation of the vehicle ignition key of the vehicle on which the camper body is mounted. Emergency release switches are provided to insure release of the lock, if necessary, even though the ignition switch may be



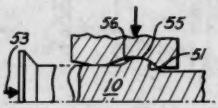
turned on, and the device is "fail safe" so that occupants of the camper body will not be inadvertently trapped therein.

3,636,746

ROLL-FORMING OF TRANSITION SURFACES ON CYLINDRICALLY SHANKED ELEMENT

William E. Duncan, Garden Grove; Harry L. F. Kau, Redondo Beach, and Lawrence H. Livermont, Glendora, all of Calif., assignors to Hi-Shear Corporation, Torrance, Calif.

Filed Feb. 2, 1970, Ser. No. 7,459
Int. Cl. B21h *1/00, 3/02*
U.S. Cl. 72—100 **5 Claims**



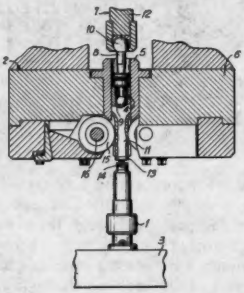
A method for forming transition surfaces to close tolerances, with cold worked properties, and with improved surface finish from the self-material of a circularly cylindrical shanked metallic workpiece. In the process, the workpiece is forced endwise against a forming surface on a roll die while the roll die is pressed radially against the workpiece. The resulting displacement of metal serves to work harden the transition surface, smooth it to the surface quality of the die itself, and hold its dimensions to the close tolerances required of the product. If desired, the transition surface can be formed as a peripheral bead, and its trailing surface formed as a consequence of springback forces in the material.

3,636,747

MECHANISM FOR CLAMPING A BLANK IN A MACHINE FOR ROLLING SPLINES

Mikhail Abramonvich Esterzon; Jury Georgievich Kozyrev, both of Moscow, U.S.S.R.; Mikhail Osipovich Yakobson, deceased, late of Moscow, U.S.S.R., and Anna Semenovna Yakobson, executor, Profsojuznaya ulitsa 40, Korpus 1, kv. 33, Moscow, U.S.S.R.

Filed Sept. 16, 1969, Ser. No. 858,915
Int. Cl. B21b *13/12*
U.S. Cl. 72—214 **3 Claims**



A clamping device for holding a blank in a machine for making splines by a multiroller rolling head comprises a sta-

tionary supporting center and a clamping center which is moved by a drive means along guides located in the head housing and may be angularly self-adjusted during the rolling process.

3,636,748

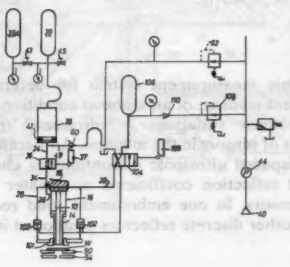
DRAWING OF SHEET METAL

George Roberts Hall, 32. Amesbury Road, Moseley, Birmingham, 13, and Robert Alexander Lyall, 22 Morven Road, Sutton Coldfield, Warwickshire, both of England

Continuation-in-part of application Ser. No. 752,010, Aug. 12, 1968, now abandoned. This application Mar. 24, 1969, Ser. No. 809,493

Int. Cl. B21d *24/02*

U.S. Cl. 72—349 24 Claims



The disclosure relates to an apparatus for the cold drawing of sheet metal consisting of a plurality of punches adapted for mounting on a crosshead of a press and telescopically received within one another for intermittent relative movement, said punches being arranged to cooperate with a plurality of stationary dies of progressively decreasing size, whereby to draw an initially flat or substantially flat workpiece of sheet metal into the shape of a container, a control circuit being provided for each telescoping punch, which circuit or circuits embody at least one energy-storage section adapted to contain a compressible fluid as an energy-storage medium.

3,636,749

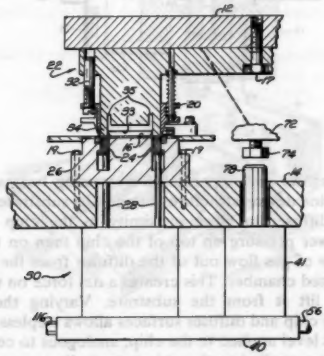
HYDRAULIC PRESSURE CONTROL APPARATUS

Elmer F. Heiser, 8313 Pin Oak Lane, Parma, Ohio

Filed May 20, 1969, Ser. No. 826,120

Int. Cl. B21d *26/14*

U.S. Cl. 72—351 22 Claims



A stamping apparatus includes a pressure pad means for supporting a blank and a movable upper die portion for shaping the blank. Hydraulic cushion means yieldably opposes movement of the pressure pad means during shaping of the blank in response to movement of the upper die through a work stroke. At a predetermined point in the work stroke, an expansion chamber, connected by passageways to the hydraulic cushion means, expands at a rate sufficient to release the hydraulic pressure in the hydraulic cushion means such that the yieldable opposition of the hydraulic cushion means is removed.

3,636,750

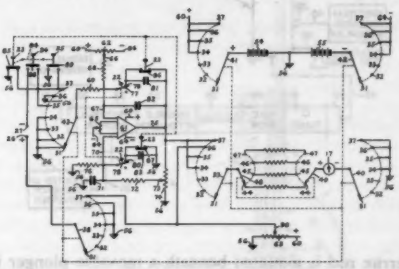
DEVICE FOR MEASURING TARE AND CALIBRATION ERRORS OF CONVEYOR BELT WEIGHING SCALES

Matthew H. Wojcik, Garfield, N.J., assignor to Merrick Scale Mfg. Company, Passaic, N.J.

Filed Aug. 24, 1970, Ser. No. 66,540

Int. Cl. G01g *23/00*

U.S. Cl. 73—1 B 19 Claims



The electrical rate output signal of an endless conveyor belt scale, consisting of the product of the load on the conveyor belt and the rate of travel of the conveyor belt, or the amplified weight of the load with the rate of travel of the conveyor belt constant, varies positively and negatively due to the tare weight variations of the conveyor belt and said tare weight variations are averaged out so that the algebraic sum of all the tare signal variations equal zero when the endless conveyor belt makes one complete revolution or multiple revolutions. The endless conveyor belt scale is also calibrated by a specified signal level having a magnitude equal to the signal level produced by either test chains or test weights on an endless conveyor belt weight sensing platform.

3,636,751

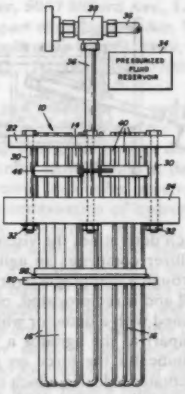
RADIAL FLOW CELL

Joseph Pasini, III; William K. Overbey, Jr., both of Morgantown, and Franklin D. Slagle, Kingwood, all of W. Va., assignors to The United States of America as represented by the Secretary of the Interior

Filed Sept. 1, 1970, Ser. No. 68,689

Int. Cl. G01n *15/08*

U.S. Cl. 73—38 4 Claims



A radial flow cell and associated method for measuring the directional permeability of a porous rock sample. While the

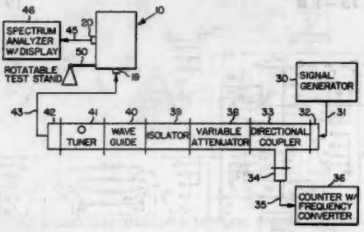
sample is constrained in the flow cell, fluid under pressure is forced radially through it. Directional permeability is determined by comparing the relative amounts of fluid flowing out of the sample into distinct collecting areas.

3,636,752

MICROWAVE FERRITE ACCELERATION SENSOR

Thomas Koryu Ishii, Brown Deer, Wis., assignor to Mega Power Corporation, Rochester, N.Y.

Filed Sept. 14, 1970, Ser. No. 71,668
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 R 5 Claims



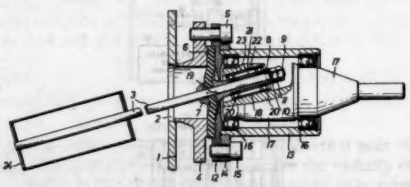
A ferrite rod is mounted beneath a movable plunger in a brass cavity resonator, which has resonant properties at microwave frequencies. The plunger applies stresses to the rod proportional to the acceleration of the plunger in a direction parallel to the ferrite central axis. The ferrite internal magnetic field changes with the stresses developed therein resulting from the pressure of the plunger. These changes effect alteration in the ferrite effective permeability and effect proportionate changes or shifts in the cavity resonant frequency. The changes in the resonant frequency may be monitored thus producing an accelerometer.

3,636,753

AGITATOR AND VISCOSIMETER FOR SUGAR SIRUP OR THE LIKE AND APPARATUS UTILIZING THE SAME

Henry Thiele; Tilo Von Doring, and Gerd Wegner, all of Wevelinghoven, Germany, assignors to Pfeifer & Langen, Cologne, Germany

Filed July 29, 1968, Ser. No. 748,366
Claims priority, application Germany, Nov. 23, 1967, P 42701
Int. Cl. G01n *11/14, 11/16*
U.S. Cl. 73—59 16 Claims



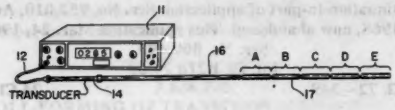
A viscosimeter which determines the viscosity of sirup in a batch vacuum crystallizer comprises an agitator including a rod which extends through a diaphragm overlying an opening in the crystallizer wall and is reciprocated, oscillated or wobbled by a drive combined with a detector which measures the force necessary to impart to the agitator a recurrent movement. The detector indicates the force on a viscosity scale and simultaneously actuates a device which records a viscosity curve. The viscosimeter forms part of an automatic control system which regulates the operation of the crystallizer.

3,636,754

ULTRASONIC PROFILE MEASURING APPARATUS

Lawrence C. Lynnworth, Waltham; Dana R. Patch, and Edmund H. Carnevale, both of Beverly, all of Mass., assignors to Parametrics, Inc., Waltham, Mass.

Filed July 16, 1970, Ser. No. 55,506
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.8 R 19 Claims



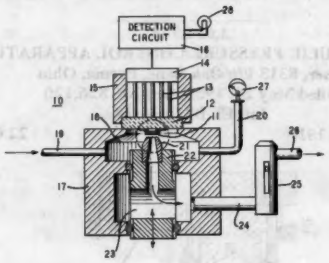
An ultrasonic measurement system for determining the profile in a fluid medium of an ambient condition, variations in which produce variations in ultrasonic transmission characteristics of sensors in the medium. An iterated series of identical equispaced ultrasonic discontinuities characterized by individual reflection coefficients no greater than 0.10, define the sensors. In one embodiment solid rods are employed; in another discrete reflectors positioned in the medium are used.

3,636,755

TESTING BOND STRENGTH OF SEMICONDUCTOR DEVICE ASSEMBLIES

Edward Joseph Boore, Allentown, and Delos Mason Sutter, Lenhartsville, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 4, 1970, Ser. No. 43,351
Int. Cl. G01n *19/04*
U.S. Cl. 73—37 8 Claims



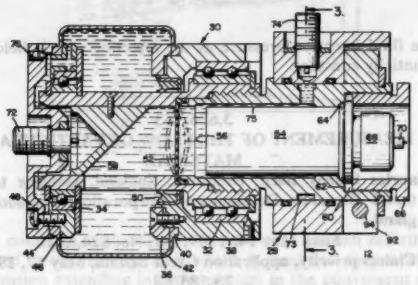
A test method and apparatus for stressing beams leaded semiconductor device structures bonded to substrates is disclosed. A diffuser in close proximity to the chip surface causes a lower pressure on top of the chip than on the bottom because of gas flow out of the diffuser from the enclosing pressurized chamber. This creates a net force on the chip tending to lift it from the substrate. Varying the space between the chip and diffuser surfaces allows stepless control of the stress level applied to the chip, analogous to centrifuging. The force applied to the chip is typically increased to a predetermined value which is defined, using an established calibration technique, by the chamber pressure and the gas flow rate. However, forces great enough to remove the chip from the substrate may be generated if desired. This test method is also suitable for stressing a plurality of chips simultaneously.

3,636,756

ULTRASONIC SEARCH UNIT WITH ROLLING CONTACT

Allwyn M. White, Danbury, Conn., assignor to Automation Industries, Inc., Century City, Calif.

Filed Sept. 11, 1969, Ser. No. 857,104
Int. Cl. G01n 29/00
U.S. Cl. 73—71.5 12 Claims



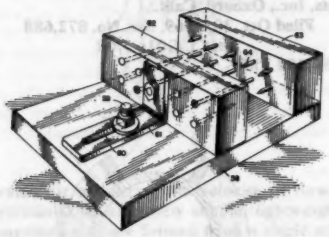
An ultrasonic wheel search unit for testing elongated bodies wherein a fluid impervious, flexible, ultrasonically transparent diaphragm defines a fluid-filled wheel chamber and a separate fluid-filled transducer chamber, enabling rapid transducer change. Means are provided to vary the relative pressure between dissimilar fluids in the two chambers to vary the beam pattern of the search unit.

3,636,757

MEASURING THE TENDERNESS OF MEAT

Leo J. Hansen, Clarendon Hills, Ill., assignor to Armour and Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 776,234, Nov. 15, 1968, which is a continuation-in-part of application Ser. No. 705,722, Feb. 15, 1968, now abandoned. This application May 15, 1970, Ser. No. 37,729
Int. Cl. G01n 3/48
U.S. Cl. 73—81 4 Claims



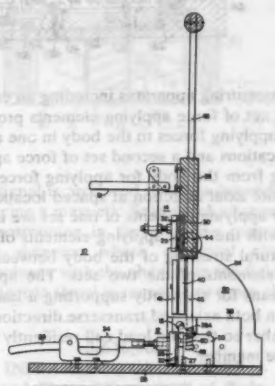
In probe testing a body of raw meat which has been severed from the carcass to determine how tender the meat will be upon cooking, the meat body is supported in depth against lateral displacement as the probe is pressed into the meat body for measurement of the resistance of the meat to the movement of the probe.

3,636,758

BEND-STRETCH APPARATUS FOR TESTING FORMABLE MATERIAL

Francis G. McKee, New Kensington, and Roger C. Haddon, Monroeville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 20, 1970, Ser. No. 29,835
Int. Cl. G01n 3/20
U.S. Cl. 73—100 6 Claims



A device for testing the effect of forming forces on the surface of or on a coating applied to a formable material, the device including two spaced-apart means for clamping the material, and a radius corner means located in a fixed position between the two clamping means in substantial alignment therewith. On each side of the corner means is disposed a structure providing cam surfaces located in a fixed radial relationship to the corner means. At least one of the clamping means is provided with cam following means disposed to engage the cam surfaces. When the movable clamping means is moved along the extent of the cam surfaces, with a test piece of the formable material tightly clamped between the clamping means, the test piece is bent and elongated in the manner encountered in a forming operation in which the material undergoes a substantial amount of stretching while being subjected to a substantial bend.

3,636,759

PROCESS OF PENETRANT INSPECTION

James R. Alburger, 5007 Hillard Ave., La Canada, Calif.

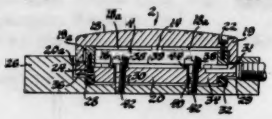
Continuation-in-part of application Ser. No. 804,200, Mar. 4, 1969. This application Sept. 9, 1969, Ser. No. 856,462
Int. Cl. G01n 21/00
U.S. Cl. 73—104 1 Claim

Compositions and processes for providing a selective increase in wash-removability of surface penetrant and entrapments of penetrant in shallow surface discontinuities, as compared with penetrant entrapments in deeper cracks. Water-washable gel-forming inspection penetrants are constructed using a balanced combination of hydrophylic surfactant and relatively volatile lipophylic synergist constituents. Thin layers of penetrant coated on test surfaces and allowed to drain and dry for a suitable period of time will tend to selectively lose part or most of the synergist constituent in surface layers, while considerably less loss will occur in penetrant contained in deep cracks. The selective loss of synergist from surface layers or shallow entrapments, will permit such penetrant layers to lose much of their gel-forming capability, and thus become more readily removable in a water wash, thereby providing an improved contrast of crack indications against an unwanted background of fine surface indications.

3,636,760
FORCE MEASURING APPARATUS

Ralph S. Shoberg, Farmington, Mich., assignor to GSE Incorporated, Detroit, Mich.

Filed Feb. 25, 1970, Ser. No. 13,942
Int. Cl. G01l *1/22*
U.S. Cl. 73—141 A **34 Claims**

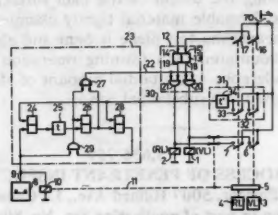


Force measuring apparatus including an endless body having a first set of force applying elements projecting from the body for applying forces to the body in one axial direction at spaced locations and a second set of force applying elements projecting from the body for applying forces to the body in the opposite axial direction at spaced locations on the body. The force applying elements of one set are in staggered relationship with the force applying elements of the other set to cause flexural stressing of the body between adjacent force applying elements of the two sets. The apparatus also includes means for resiliently supporting a load cell on a base member in both axial and transverse directions relative to the base member so that the load cell resiliently "floats" relative to the base member.

3,636,761
MOTOR CUTOFF AND DELAYED REVERSING CIRCUIT FOR A RECORDING AND PLAYBACK APPARATUS

Hermann Bretschneider; Viktor Czonka, and Karl Rupp, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,857
Claims priority, application Austria, Jan. 31, 1969, A981/69
Int. Cl. G11b *15/06*
U.S. Cl. 179—100.2 S **4 Claims**



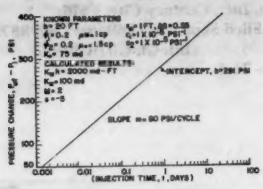
A reversing apparatus for recording and playback devices where a group of multivibrators, logic circuits, and delay elements operate to stop the motor of the recording and playback device, and after a delay sufficient to ensure that all inertial movement has stopped reverses the motor.

3,636,762
RESERVOIR TEST

Chiang-Hai Kuo, Houston, Tex.; Ronald P. Nordgren, The Hague, Netherlands, and John P. Vogiatzis, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed May 21, 1970, Ser. No. 39,341
Int. Cl. E21b *47/10*
U.S. Cl. 73—155 **6 Claims**

A method for measuring reservoir properties including skin factor and permeability thickness product of a porous earth formation with respect to injected fluid around a fluid injection well by rapidly increasing the rate of fluid injection to a new higher rate, maintaining injection substantially constant at this higher rate, and recording the variation with time of

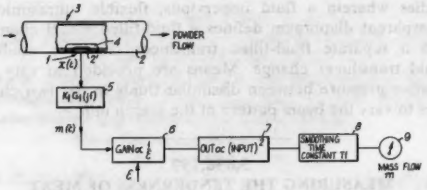


the fluid injection pressure as the injection rate is held substantially constant.

3,636,763
MEASUREMENT OF THE FLOW OF PARTICULATE MATERIAL

Maurice Sidney Beck, Bradford, England, assignor to National Research Development Corporation, London, England

Filed May 14, 1969, Ser. No. 824,612
Claims priority, application Great Britain, May 17, 1968, 23,585/68
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 E **9 Claims**

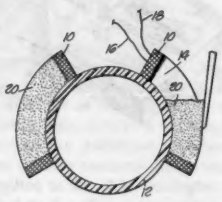


A method of measuring the flow rate of particulate material in pneumatic conveyors in which random perturbations in the material flowing through the conveyor are sensed and utilized to generate a noise signal the power of which is a measure of the flow rate of the particulate material.

3,636,764
ELECTROMAGNET FOR BLOOD FLOWMETERS AND THE LIKE

Horst Funfstuck, Los Angeles, Calif., assignor to Statham Instruments, Inc., Oxnard, Calif.

Filed Oct. 30, 1969, Ser. No. 872,688
Int. Cl. G01p *5/08*
U.S. Cl. 73—194 EM **3 Claims**



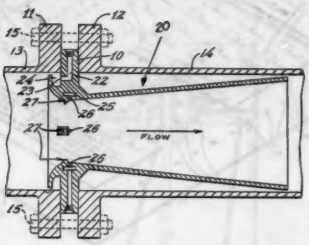
An improved electromagnet for blood flowmeters and the like is made by filling the open central portion of a magnetizing coil with a mixture of iron powder suspended in a quick-hardening epoxy resin. The mixture is thereafter heated and cured to form an electrically nonconductive magnetic core.

3,636,765

VENTURI DEVICE

William R. Brown, 341 West Mt. Vernon St., Lansdale, Pa.

Filed May 21, 1969, Ser. No. 826,624
Int. Cl. G01f 1/00
U.S. Cl. 73—213 3 Claims



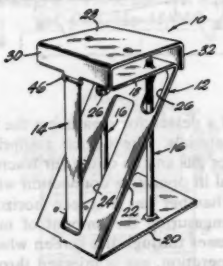
A compact, high-differential, low-loss, Venturi utilizing a curved upstream approach which is modified to provide a protrusion extending into the venturi in the convergent section thereof immediately upstream of the low-pressure tap. The protrusion extends into said venturi less than the Boundary layer thickness of the fluid flowing in the device thereby creating and constantly maintaining a turbulent action of the boundary layer in the localized area of the low-pressure tap, regardless of flow rate of flow conditions and a recovery section tangential or in continuous surface relation thereto.

3,636,766

VELOCITY METER

Philip R. Austin, Livonia, Mich., assignor to Contamination Control Laboratories, Livonia, Mich.

Filed May 11, 1970, Ser. No. 36,211
Int. Cl. G01f 1/00
U.S. Cl. 73—228 10 Claims



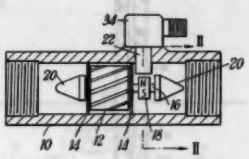
Apparatus for measuring the velocity of flow of a fluid. The apparatus is an extremely simple, lightweight, low-cost item comprising a frame formed from a single strip of sheet material, a vane hingedly connected in pendulum fashion to the frame and responsive to the rate of flow of the fluid for movement to a position corresponding to the velocity of flow of the fluid. Indicia are located on the frame to indicate the rate of flow of the fluid. Adjustment means are provided for altering the shape of the frame a limited extent so as to set the static position of the vane at a zero position on the indicia. The apparatus can be mounted in a variety of positions for the purpose of measuring the rate of flow of the fluid.

3,636,767

MEASUREMENT OF FLUID FLOW

Laurence Sidney Duffy, Redbourn, St. Albans, England, assignor to George Kent Limited, Luton, England

Filed June 10, 1968, Ser. No. 735,688
Claims priority, application Great Britain, June 16, 1967, 27,979/67
Int. Cl. G01f 1/06
U.S. Cl. 73—229 7 Claims



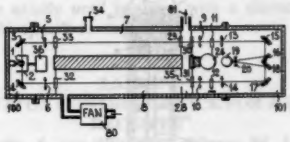
An electric signal is produced which is dependent on fluid flow, by producing a magnetic field which changes with fluid flow and by positioning in the changing magnetic field a semiconductor detector whose electrical characteristics change in accordance with the changes in the field and which produces the electric signal in response to those changes.

3,636,768

INFRARED HYGROMETERS

Claude Tinet, and Pierre Misme, both of Paris, France, assignors to Thomson-CSF

Filed June 18, 1970, Ser. No. 47,450
Claims priority, application France, June 30, 1969, 6921968
Int. Cl. G01n 21/34
U.S. Cl. 73—336.5 4 Claims



An infrared hygrometer comprising an infrared source supplying two identical infrared beams chopped alternately. One of the beams passes through an enclosure containing dry air at the atmospheric pressure and the other beam passes through a second enclosure in which the air whose humidity is to be measured circulates. Two auxiliary cavities in which this air also circulates are located in the path respectively of the two beams and have windows for the passage of these beams. The cavity which is disposed in the path of the beam passing through the second enclosure communicates with this enclosure by an opening through which this beam passes, so that the number of faces of windows in contact with the humid air is identical in the paths of the two beams. An infrared detector receives the two beams and its output signal is applied to measuring circuits with synchronous detection.

3,636,769

EXPLOSIONPROOF CANDY THERMOMETER

John L. Chaney, Lake Geneva, Wis.

Filed Mar. 30, 1970, Ser. No. 23,815
Int. Cl. G01k 1/12
U.S. Cl. 73—371 3 Claims

A candy thermometer is made explosionproof by forming the outer protective tube with an open upper end which is closed by means of a plastic cap which normally is fric-

tionally but removably held in sealing relation and which softens and distorts before the temperature and hence the pressure of the air in the tube exceed safe limits, thereby relieving the internal air pressure.

3,636,770

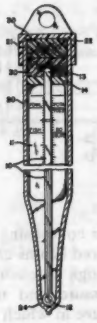
CANDY THERMOMETER

John L. Chaney, Lake Geneva, Wis.

Filed June 22, 1970, Ser. No. 48,378

Int. Cl. G01k *1/16, 5/04*

U.S. Cl. 73—376 **3 Claims**



A candy thermometer in which the thermometer bulb is held in heat transfer relation with the lower end of the protective tube by resilient means, eliminating the use of the usual tin anchor and making the thermometer and its card replaceable.

3,636,771

MULTIFREQUENCY SAMPLING SYSTEM AND METHOD

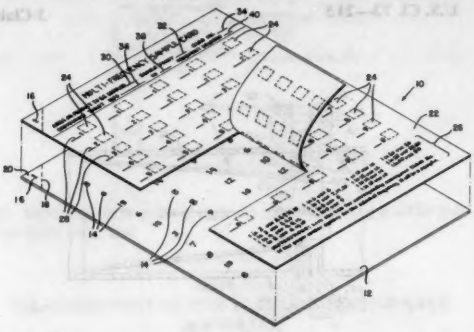
Byron F. Grove, 200 Mount Ave., Missoula, Mont.

Filed Dec. 11, 1969, Ser. No. 884,163

Int. Cl. G01n *1/00*

U.S. Cl. 73—421 R **13 Claims**

Multifrequency sampling system utilizing an underlay card with an arrangement of sampling numbers on its face which are identified by a code designation. An overlay or face card covering the sampling numbers is provided with tabs which can be removed or lifted to reveal a number on the underlay card. On the face card is a frequency table correlated to the sampling numbers. A frequency selected from the frequency table indicates which numbers on the underlay card will designate a sample to be taken.



3,636,772

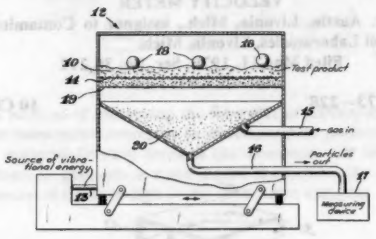
DEVICE FOR MEASURING THE FRIABILITY OF PARTICULATE SOLID MATERIALS

Harold L. Bennett, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 24, 1970, Ser. No. 13,715

Int. Cl. G01n *19/00*

U.S. Cl. 73—432 R **4 Claims**



A method and a device for measuring the friability of particulate solid materials. The device comprises a chamber, having an inlet for gas and an outlet for fractured particles of the solid material in operative connection with means for its vibration. The chamber has a screen horizontally mounted and means for measuring the amount of material which is fractured and passes through the screen when the container is vibrated. In operation, gas is injected through the inlet to force the fractured material through the outlet.

3,636,773

APPARATUS FOR USE IN BALANCING MOTOR VEHICLE AND OTHER WHEELS

Gerhart Wilhelm Harant, Blackburn, Victoria, Australia, assignor to Repco Research Proprietary Limited, Dandenong, Victoria, Australia

Filed Sept. 15, 1969, Ser. No. 857,982

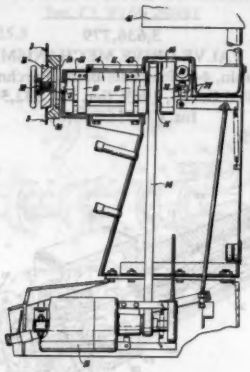
Claims priority, application Australia, Sept. 17, 1968, 43460

Int. Cl. G01m *1/22*

U.S. Cl. 73—466 **6 Claims**

Apparatus for balancing motor vehicle and other wheels and which consists of a combination of mechanical devices

and an electrical system for rotating the wheel and a supporting shaft and utilizing the reaction in a plurality of shaft supports for producing an electrical analogue in said system for determining the weight and operative positions of balance weights that require to be fitted in balancing planes in the inner and outer rim portions of the wheel, adjustable mounting means being provided on a free end portion of the shaft so that the inner balancing plane of the wheel is located in



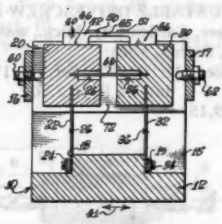
substantially the same plane extending transversely of the shaft as that in which the adjacent shaft support and its reaction zone is located, rotation of the wheel and its shaft being predetermined so that the system is high tuned and the resultant signals produced by the dynamic components of the reaction in the shaft support in each said zone are evaluated by said electrical system and utilized to determine during a single wheel testing operation the respective weights of at least two of said balance weights.

3,636,774

DUAL MASS ACCELEROMETER WITH SEMICONDUCTIVE TRANSDUCER

James H. Allison, Arcadia, Calif., assignor to Conrac Corporation, New York, N.Y.

Filed Aug. 25, 1969, Ser. No. 852,633
Int. Cl. G01p *15/08*
U.S. Cl. 73—496 **9 Claims**



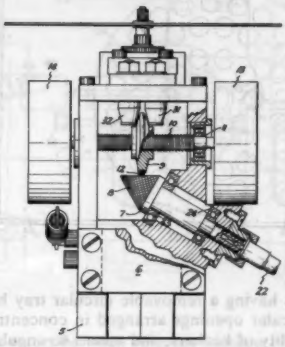
The inertial bodies are mounted for limited swinging movement about respective parallel, mutually spaced axes, with the centers of mass offset equally in a common direction from the axes. Acceleration parallel to the plane of the axes is sensed by flexure of beam structure interconnecting the bodies and carrying one or more semiconductive strain gage elements. The suspension and beam structure are protected against shock damage by positive stop means, and by selective damping produced by powdered metal in a closed chamber within one or both of the bodies. The powder gives little damping in the frequency range of interest, but is highly effective at higher frequencies including the natural frequency of vibration of the suspended system. A low-pass filter disables the output signal in the range of variable damping.

3,636,775

SPEED-MEASURING INSTRUMENT

Alexander B. Savidge, 33 Russell St., Oatley, New South Wales, Australia

Filed June 26, 1969, Ser. No. 836,858
Claims priority, application Australia, July 8, 1968, 40364
Int. Cl. G01p *3/06*
U.S. Cl. 73—507 **8 Claims**



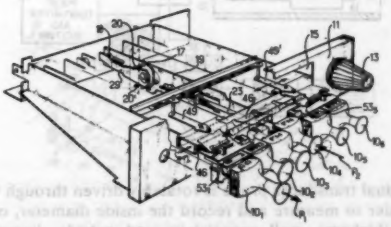
A speed measuring device having a threaded shaft holding a threaded measuring disc thereon, this shaft being driven at an unknown speed. The periphery of the measuring disc engages a cone which is driven at a known speed causing the disc to move axially until it aligns with a diameter on the cone where the speeds correspond.

3,636,776

PUSHBUTTON CONTROL DEVICE FOR A RADIO RECEIVER

Robert Grandin, 6, rue d'Estienne d'Orves 94, Le Perreux, France

Filed Oct. 6, 1969, Ser. No. 864,125
Claims priority, application France, Oct. 4, 1968, 168697
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.33 **7 Claims**

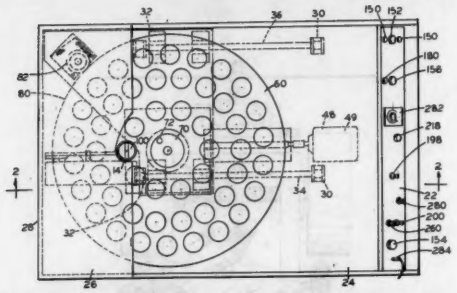


A pushbutton device for tuning telecommunication receivers, such as radio receiving sets, which provides for instantaneous adaptation to local broadcasting and reception conditions by manipulation of the pushbutton which is assigned a multiplicity of wave bands and/or the types of modulations within the range of the receiver.

3,636,777
LABORATORY BEAKER TRANSPORTER AND ELEVATOR

Jack D. Frank, Oriskany, and Michael L. Perretta, Manlius, both of N.Y., assignors to Vision Laboratories, Inc., Oriskany, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,259
Int. Cl. G01n *1/00*
U.S. Cl. 73—53 **5 Claims**

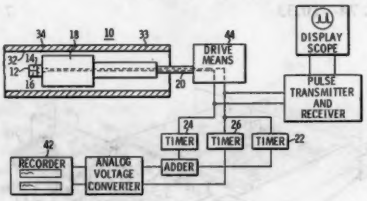


Apparatus having a removable circular tray having a plurality of circular openings arranged in concentric circles to hold a plurality of beakers, and means to angularly advance the tray from beaker to beaker after elevating each beaker in sequence to a test position, at a beaker elevating station, and means to shift the tray laterally from one circle to another for repetition, at the conclusion of moving all the beakers in one circle through the test position.

3,636,778
METHOD AND MEANS FOR DIMENSIONAL INSPECTION OF TUBING

Richard O. Huffstetler, Bethel Park, Pa., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed June 5, 1970, Ser. No. 43,709
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.8 R **1 Claim**

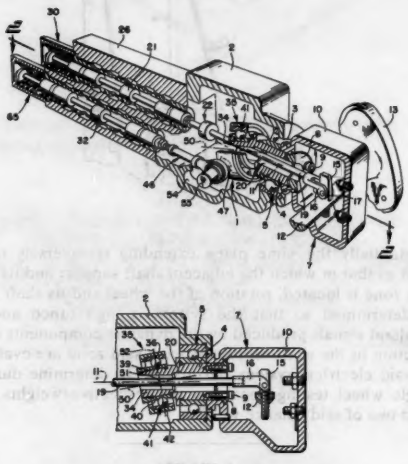


A dual transducer probe is rotatably driven through tubing in order to measure and record the inside diameter, ovality, wall thickness, wall eccentricity and outside diameter of same. A first transducer is connected to a timing device which is started by the transmission of a pulse generated by the first transducer and stopped by the reception of the reflected energy from the inside wall of the tubing. A second clock or timing device is also connected to the first transducer which is started by the reception of the reflected energy from the inside surface of the pipe and stopped by the reception of reflected energy from the outside surface of the pipe. A second transducer is connected to still another timing device which is started by the transmission of a pulse from same and stopped by the reception of this pulse from the inside surface of the tubing. The elapsed time on the various timing devices, suitably converted to electrical voltages, are added in the case of the first and third timing devices in order to measure the inside diameter and ovality of the tubing; and the elapsed time on the second timing device may be recorded to indicate the thickness and eccentricity of the tubing.

3,636,779
VALVE DRIVE MECHANISM

Richard J. Lappin, 442 Parkdale Blvd., Parchment, Mich.

Filed Dec. 5, 1969, Ser. No. 882,506
Int. Cl. F16h *33/00*
U.S. Cl. 74—89 **16 Claims**

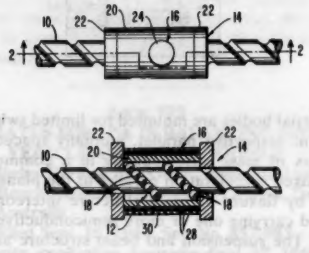


Drive mechanism includes a rotatably mounted, canted cylindrical land on which is journaled a drive assembly retained against rotation but permitted to move in a longitudinal direction, whereby rotation of the cylindrical land causes a nutating or wobbling movement of the drive assembly which is transmitted to an output device through a suitable link connection.

3,636,780
ACTUATABLE DRIVESCREW DEVICE

Harry L. Wallace, Garden City, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 9, 1970, Ser. No. 17,386
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **5 Claims**



A drivescrew is provided with a sleeve-type housing containing a plurality of balls engageably associated with that portion of the helical threads of the screw translatably disposed therewithin, the balls being actuatably prevented or

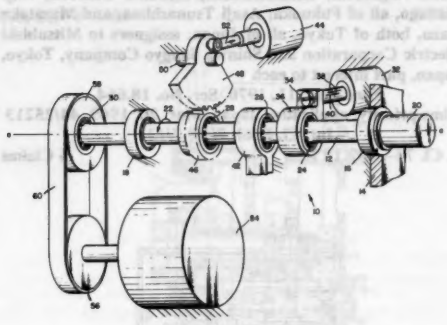
permitted to revolve with the threads of the screw to thereby translate or not translate, respectively, the sleeve-type housing along the screw as the latter is rotated.

3,636,781

INCREMENTAL ROTATION APPARATUS

Robert R. Elliott, La Crescenta, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 2, 1969, Ser. No. 863,291
Int. Cl. F16h 29/00
U.S. Cl. 74—125.5 12 Claims



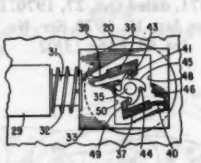
Apparatus for providing incremental rotation of a shaft and having a continuous drive capability. A plurality of unidirectional clutches are coupled in operative arrangement to the shaft such that the shaft is rotatable in one direction only relative to the clutches. First drive means is coupled to one of the clutches for incrementally driving the shaft in the one direction, while the outer housing of a second one of the clutches is maintained stationary for preventing backlash of the shaft. A third one of the clutches coupled to a motor for continuously driving the shaft. A preferred embodiment of the invention is utilized for incrementally driving a tape capstan and alternatively for continuously driving the capstan, and can further be provided with second drive means coupled to a fourth one of the clutches for producing an interblock gap on the tape.

3,636,782

INDEXING MECHANISM

William B. Huber, Park Forest, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 17, 1969, Ser. No. 834,076
Int. Cl. F16h 27/02
U.S. Cl. 74—143 10 Claims



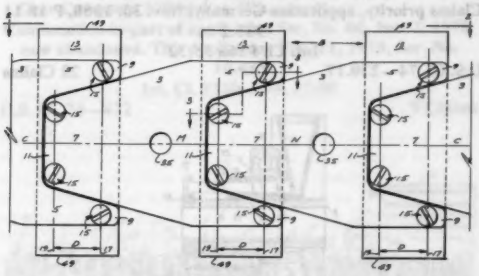
A pawl and ratchet device actuated by a solenoid for rotating the cam of a cartridge-type tape player to position the magnetic tape head adjacent different tracks on the tape includes a unitary plastic pawl element having an opening therein for receiving the ratchet wheel and further having first and second pawls integrally formed as part of the pawl element and attached to the sides of the opening thereof by a restricted portion forming a spring biasing the pawls into engagement with the ratchet. Surfaces are provided on opposite sides of the opening in the pawl element for engaging the ratchet wheel in the extreme positions of motion of the element in both directions to prevent further rotation of the ratchet at the limits of movement of the element.

3,636,783

FLEXIBLE BELT CARRIER MECHANISM

Duane W. Woltjen, Manchester, Mo., assignor to UMC Industries, Inc., St. Louis, Mo.

Original application Dec. 12, 1969, Ser. No. 884,511. Divided and this application Feb. 16, 1971, Ser. No. 115,258
Int. Cl. F16h 7/02; F16g 7/00, 13/02
U.S. Cl. 74—229 7 Claims



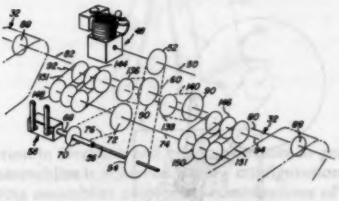
Rigid connectors between adjacent portions of flexible belt elements are fastened thereto in such a manner that when the belt flexes as it moves over supporting drums bending stresses are avoided at the fastenings. The flexible belt may be of segmental or continuous form. The connectors may be in the form of carrier plates employed to carry pieces to be worked upon during the movements of the connectors, or the connectors may be of a form or carry means to push unattached objects. In either case, movements may be continuous or intermittent. In cases in which the connectors are massive or carry massive parts, means are provided to prevent inertial oscillations during changes from translatory to angular movements of the connectors.

3,636,784

BELT-PULLEY TRANSMISSION

Grant H. Sanstrom, P.O. Box 2515, Yakima, Wash.

Original application Oct. 29, 1968, Ser. No. 766,078, now Patent No. 3,595,332. Divided and this application Apr. 15, 1971, Ser. No. 134,308
Int. Cl. F16h 9/00; B62d 11/00
U.S. Cl. 74—217 R 9 Claims



A drive system including a first rotary drive shaft, a pair of driven rotary half shafts and a pair of rotary jack shafts. The shafts generally parallel each other and the jack shafts are supported for independent swinging movement about the half shafts toward and away from the drive shaft. Longitudinally spaced portions of the drive shaft are drivingly connected to the jack shafts through drive belts trained about pulleys on the drive and jack shafts. The jack shafts are drivingly con-

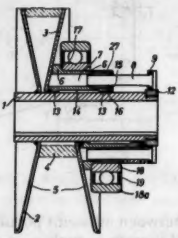
nected to the half shafts through drive chains trained about sprocket wheels on the jack and half shafts and brake means are operatively associated with the jack shafts for braking the latter when they are moved toward the drive shafts, which movement of the jack shafts simultaneously untensions the belts drivingly connecting the drive shaft to the jack shafts.

3,636,785

V-BELT PULLEY

Berno Weindler, Wiesloch, Baden; Robert Ruprecht, Aichelberg Kreis Esslingen am Neckar, and Heinrich Grimm, Raidwangen Kreis Nurtingen, all of Germany, assignors to Ernst Heinkel Aktiengesellschaft, Stuttgart-Zuffenhausen, Germany

Filed Nov. 26, 1969, Ser. No. 880,235
Claims priority, application Germany, Nov. 30, 1968, P 18 11 935.2
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **22 Claims**



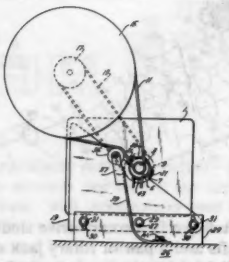
A pair of belt transmission flanges are mounted on a rotatable shaft with at least one of the flanges biassed in direction toward and axially movable to and from the other flange so as to adjust the width of the belt gap defined between the two flanges. The at least one movable flange comprises a hub, the inner peripheral surface of which spacedly surrounds the outer cylindrical surface of the rotatable shaft with a pair of bearing members axially spaced between and in contact with these surfaces. A torque transmitting member interconnects the at least one movable flange with the rotatable shaft so as to effect rotation of the former with the latter.

3,636,786

DRIVE ADJUSTMENT FOR FIXED CENTER DRIVE

Leo V. Buck, Herrin, Ill., assignor to Fedders Corporation, Edison, N.J.

Filed Sept. 3, 1970, Ser. No. 69,232
Int. Cl. F16h *7/12, 7/10*
U.S. Cl. 74—242.11 R **8 Claims**



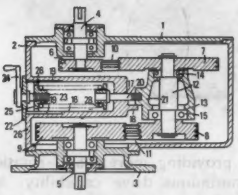
A motor, having a shaft, is pivotally mounted for rotation about an axis parallel to but displaced from the axis of the shaft. First and second pulleys are mounted on said shaft for driving a pair of rotatable devices through first and second belts respectively. A spring mounted idler applies a predetermined tension to the second belt and a stop member is mounted to the motor for preventing the idler from contacting the second pulley when the second belt is either broken or removed. The stop is positioned so that the idler exerts upon the motor a predetermined moment about the axis when the idler contacts the stop and said moment establishes the proper tension of the first belt.

3,636,787

BELT POWER TRANSMISSION DEVICE

Kazumi Nagafuchi; Hitoshi Inada; Nobuaki Ohmura; Seiji Manago, all of Fukuoka; Asaji Tsunashima, and Masataka Hazu, both of Tokyo, all of Japan, assignors to Mitsubiski Electric Corporation and Shinwa Sangyo Company, Tokyo, Japan, part interest to each

Filed Mar. 11, 1970, Ser. No. 18,664
Claims priority, application Japan, Mar. 20, 1969, 44/25213
Int. Cl. F16h *7/10, 7/12*
U.S. Cl. 74—242.14 R **6 Claims**



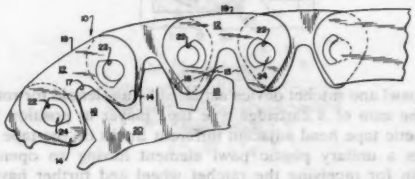
A belt power transmission device in which two intermediate pulleys, each being engaged through a different belt with another pulley, are mounted in spaced relation on opposite ends of a pulley shaft rotatably journaled in a supporting frame is provided with an apparatus for simultaneously adjusting the tension in both belts. The supporting frame is suspended from a casing support structure and is movable relative thereto along a given line, being normally urged in one direction along the line of relative movement by a spring-biasing means disposed therebetween for tensioning the belts, and the adjustment of the tension in the belts supported by the frame is made by varying the tension in the spring-biasing means and thereby causing the frame to be displaced from its original position in relation to the casing.

3,636,788

CHAIN LINK AND METHOD FOR MAKING SAME

Joseph O. Jeffrey, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Original application Aug. 15, 1966, Ser. No. 572,590, now Patent No. 3,535,871, dated Oct. 27, 1970. Divided and this application Jan. 19, 1970, Ser. No. 8,143
Int. Cl. F16g *13/02*
U.S. Cl. 74—250 S **2 Claims**



This invention relates to chain links, and, more particularly, to a chain link adapted to form a part of an endless

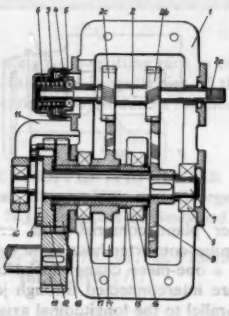
drive chain for power transmissions and the like. The invention also relates to a method for making the chain link of the invention.

3,636,789

GEAR DRIVE WITH MEANS FOR THE REMOVAL OF THE PLAY OF THE TOOTHED PROFILE

Manfred Geiger, Hohenlimburg, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed Sept. 25, 1970, Ser. No. 75,352
Claims priority, application Germany, Oct. 18, 1969, P 19 52 545.2
Int. Cl. F16h *55/18*
U.S. Cl. 74—409 7 Claims



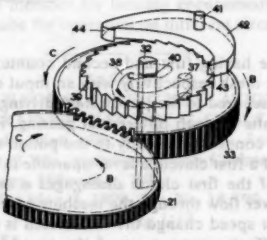
A gear drive with means for removal of the play of the toothed profile, in particular laying mechanism for armored turrets, rotary ring gun carriages or the like of weapons, which comprises a double pinion shaft axially displaceable by means of a pressure medium and equipped with oblique toothing of opposite spiral directions including pinions of equal size. Counter gears are coaxially disposed and mounted independently from each other. The pinions are in mesh at least directly with the counter gears. Each of the counter gears are connected each with a further gear by means of a shaft. The further gears are of equal size and disposed directly adjacent each other. A still further counter gear is disposed outside of the drive housing, and the further gears mesh as driven gears jointly the still further gears.

3,636,790

PLAY-ELIMINATING SETTING APPARATUS

Hermann Bertrang, and Horst Spormann, both of Villingen, Germany, assignors to Kienzle Apparate GmbH, Villingen, Black Forest, Germany

Filed Oct. 26, 1970, Ser. No. 84,060
Claims priority, application Germany, Oct. 25, 1969, G 69 41 650.8
Int. Cl. F16h *55/18*; G01d *9/00*
U.S. Cl. 74—409 10 Claims



The rotary pointer, and also a diagram carrier of an indicating and recording apparatus, are driven in a forward direction from a motor through a gear train having two branch gear trains. When the device is manually set in forward direction, play is introduced into the gear trains which is eliminated by biasing means loaded by the gear train during forward movement. During continuous setting in the rearward direction, the biasing means would be untensioned which is prevented by one-way blocking means. A lost-motion device permits rearward setting for an angle of over 180°, and then couples the gear train with the blocking means so that the gear train is blocked after limited rearward setting which negligibly untensions the biasing means.

3,636,791

GEAR OR RACK CONSTRUCTION

William A. Barr, Milwaukee, Wis., assignor to Milwaukee Gear Company, Milwaukee, Wis.

Continuation-in-part of application Ser. No. 40, Jan. 2, 1970, now abandoned. This application Feb. 11, 1970, Ser. No. 10,483
Int. Cl. F16h *1/04*, *55/06*
U.S. Cl. 74—422 9 Claims

A long rack to be engaged by a drive pinion of a gantry crane is made up of an assembly of segments mounted end-to-end. Each segment consists of two rack portions flame cut from a single blank and adhesively joined side-by-side with the respective teeth portions aligned. The teeth portions are tapered in thickness and joined at their narrow ends to make composite teeth with concave faces.

3,636,792

HERTZIAN STRESS-REDUCING MEANS FOR GEARS

Zoltan Vigh, 112 North Mar Vista Ave, Pasadena, Calif.

Filed Sept. 5, 1969, Ser. No. 862,612
Int. Cl. F16h *55/14*, *57/00*
U.S. Cl. 74—461 9 Claims

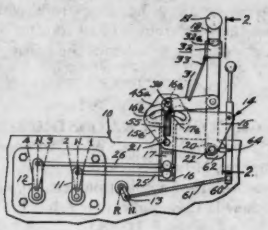
Reduction in Hertzian and bending stresses in gears and in bearing assemblies is achieved by new configurations of gears and bearing assemblies employing combinations of materials in selected areas of the gears or bearing assemblies or cutting narrow slots into selected areas of the gear teeth or bearing assemblies. The increase in life of the gear or bearing assembly is expressed as $L_1=cH/H_1n$. For gears $n=6.5$ for bearings $n=9$. The Hertzian stress reduction provides in addition to increased operating life, higher reliability, higher load-carrying capacity and gears or bearings of quieter running characteristics at higher rotational rates than gears and bearings in the prior art.

3,636,793

SHIFTING APPARATUS

William J. Bieber, Doylestown, Pa., assignor to Mr. Gasket Company

Filed Nov. 18, 1970, Ser. No. 90,548
Int. Cl. G05g 9/00
U.S. Cl. 74—473 R 17 Claims



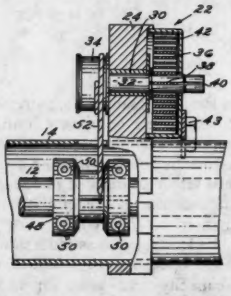
A shifter is provided for use in conjunction with a four-speed automobile transmission to permit rapid sequential gear changes without jamming upon displacement of a shift lever in alternate directions in a single plane. The shifter includes two members mounted side by side in a frame to pivot relative to one another with one member being connected to the first-second shift arm on the transmission and the other member being connected to the third-fourth shift arm on the transmission. Each member is provided with a recess which is selectively engaged by a selector pin mounted on a link carried on the shift lever to cause one or the other member to be displaced upon displacement of the shift lever. The recesses are located so as to register with one another when the shift lever and members are located in a neutral gear position to permit the selector pin to be transferred from engagement with one member and to the other, for instance during shifting from second to third gears or from either third or fourth to first or second gear. Gate means is associated with the frame for engaging the pin to prevent transfer of the pin from the first-second member during displacement of the shift lever in one direction between limit positions but to guide the pin out of engagement with the first-second connected member and into engagement with the third-fourth connected member during displacement of the shift lever in the other direction, thereby preventing the shifter from inadvertently jamming during rapid shifting and preventing unintentional shifting of the transmission into nonsequential gears during rapid upshifting or downshifting.

3,636,794

POWER STEERING SYSTEM

Warren A. Van Wicklin, Jr., Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 11, 1968, Ser. No. 782,948
Int. Cl. B62d 1/16
U.S. Cl. 74—495 2 Claims



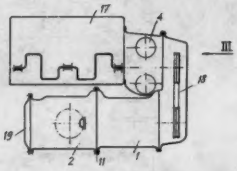
A power steering system for a motor vehicle which in its presently preferred embodiment has a power steering gear, a steering wheel, and a steering shaft connecting the wheel to the steering gear. A spiral leaf spring is connected to the steering shaft and exerts a force tending to center the steering wheel and shaft.

3,636,795

UNIT POWER PLANTS

Jean Maurice, and Jean Piret, both of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris, France

Filed Nov. 18, 1969, Ser. No. 877,781
Claims priority, application France, Nov. 26, 1968, 175359
Int. Cl. F16h 57/02
U.S. Cl. 74—606 R 3 Claims



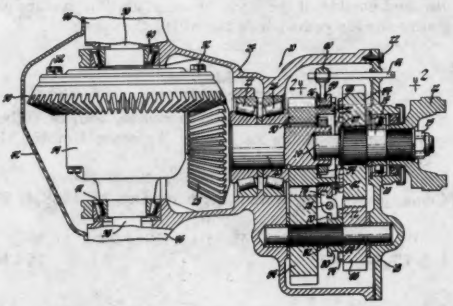
Unit power plant comprising an engine, a one-piece hydraulic torque converter housing, a two-piece differential housing and a one-piece change-speed or transmission casing, which are interconnected through joint planes perpendicular or parallel to the longitudinal axis, and characterized in that at least one of said housings or casings comprises two identical joint planes.

3,636,796

CHANGE-SPEED DRIVE AXLE

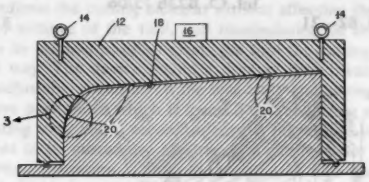
John C. Rau, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1969, Ser. No. 886,108
Int. Cl. F16h 37/08, 3/08
U.S. Cl. 74—700 5 Claims



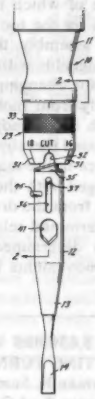
Drive axle having first and second countershaft mounted gears which mesh respectively with an input driven gear and with a gear secured to the pinion shaft drivingly connected to the axle shafts through differential gearing. For direct drive the input is connected directly to the pinion shaft by the engagement of a first clutch; a lever operable in response to engagement of the first clutch disengages a second clutch to prevent power flow through the meshing gears and the countershaft. For speed change the first clutch is disengaged and the lever effects engagement of the second clutch so that power flow is through the countershaft and the gearing provides for the geared ratio change.

3,636,797
METHOD OF FINISHING A DIE
Amos J. Moore, Philadelphia, Pa., assignor to The Budd Company, Philadelphia, Pa.
Filed Oct. 26, 1970, Ser. No. 84,039
Int. Cl. B21k 5/20
U.S. Cl. 76—107 R 2 Claims



A method of vibrating a die-spotting rack in contact with a Kellered die for marking the irregularities of the rough die for proper material removal to produce a finished die.

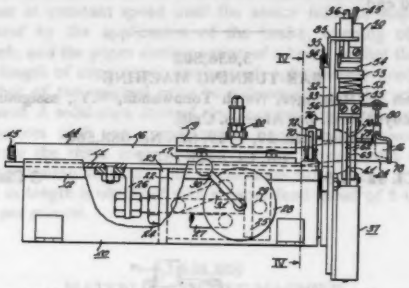
3,636,798
WIRE STRIPPER AND CUTTER
Leonard Van Dalen, Cherry Hill, and George S. Gadren, Oaklyn, both of N.J., assignors to Seaboard Fabricators, Inc.
Filed July 22, 1970, Ser. No. 57,095
Int. Cl. H02g 1/12
U.S. Cl. 81—9.5 R 6 Claims



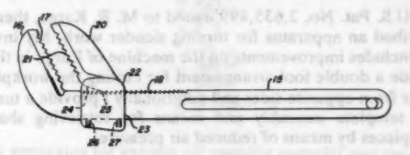
A shank having a handle fixed on one end and a tubular part slidably telescoped on the other end, with coacting cutting edges on the shank and tube for stripping and cutting wire. Carried on the shank between the handle and tube is an adjustable stop member for limiting engagement with a formation of the tube for operation on different sizes of wire.

3,636,799
APPARATUS FOR STRIPPING INSULATION FROM STRANDED ELECTRICAL CABLE
Larry R. Weitala, West Allis, and Ronald G. Anderson, Milwaukee, both of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Mar. 3, 1970, Ser. No. 16,190
Int. Cl. H02g 1/12
U.S. Cl. 81—9.51 5 Claims

Insulation is stripped from a multiple wire strand electrical cable by urging a pair of opposed, heated stripping blades having blunt edges against the cable insulation to thermally deteriorate the insulation, rotating the stripping blades, and pulling the cable in a longitudinal direction away from the stripping blades. The heated stripping blades penetrate the insulation but are sufficiently blunt so that they do not nick the wire strands of the cable.

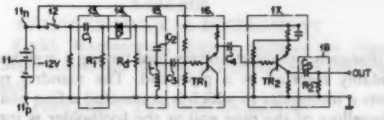


3,636,800
PIPE WRENCHES
Herman A. Myers, Lake Lynn, Pa., assignor to Insta-Snap, Inc., Monongahela, Pa.
Continuation-in-part of application Ser. No. 21,376, Mar. 20, 1970, now abandoned. This application June 30, 1970, Ser. No. 51,397
Int. Cl. B25b 13/14, 13/18
U.S. Cl. 81—145 3 Claims



A pipe wrench comprising a handle terminating in a rigid jaw having a serrated gripping surface and a plurality of teeth along one surface of the handle. A movable jaw assembly having a serrated gripping surface, an opening therethrough and a plurality of teeth along the opening is slidably positioned over the handle so that the two sets of teeth are in locking engagement. A spring means is positioned to communicate with the opening and the handle, the depression of which disengages the teeth, permitting sliding adjustment.

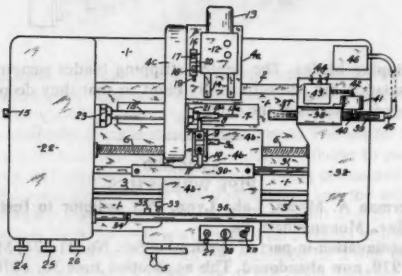
3,636,801
RIM-SHOT-SOUND-PRODUCING DEVICE FOR AN ELECTRONIC MUSICAL INSTRUMENT
Kiyoshi Ichikawa, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed Mar. 18, 1971, Ser. No. 125,637
Claims priority, application Japan, Mar. 20, 1970, 45/23377
Int. Cl. G10h 3/00
U.S. Cl. 84—1.13 5 Claims



The rim shot sound of a snare drum is simulated. Upon manipulation of a key switch, a percussive sine wave having a sudden buildup and a subsequent decay is obtained. The percussive sine wave signal is introduced into a clipper circuit

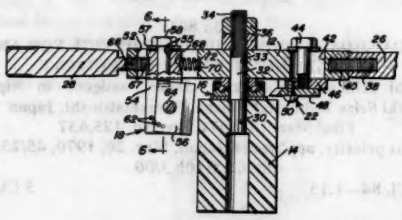
wherein the wave peaks in the beginning portion having great amplitude are clipped. The signal is then passed through a differentiation circuit, from which is obtained a percussive signal with harmonics richer in the beginning portion and less toward end.

3,636,802
BAR-TURNING MACHINE
William A. Hessinger, North Tonawanda, N.Y., assignor to Teledyne, Inc., Los Angeles, Calif.
Filed Dec. 29, 1969, Ser. No. 888,560
Int. Cl. B23b *13/02*
U.S. Cl. 82—2.5 3 Claims



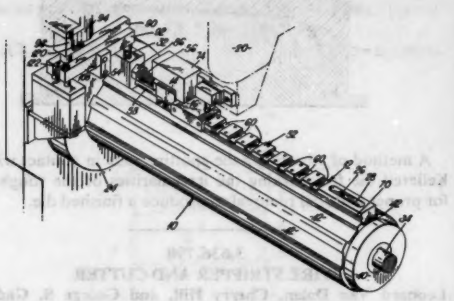
In U.S. Pat. No. 2,635,499 issued to M. R. Karge, there is described an apparatus for turning slender work. My invention includes improvements on the machine of Karge in that I provide a double tool arrangement for cutting the workpiece or bar from opposite sides and additionally I provide a turret-type template assembly and means for retrieving shaped workpieces by means of reduced air pressure.

3,636,803
PIPE-BEVELLING TOOL
Cornelius C. Miller, 10135 S. W. Inez St., Tigard, Oreg.
Filed Nov. 14, 1969, Ser. No. 876,904
Int. Cl. B23b *5/16*
U.S. Cl. 82—4 C 4 Claims



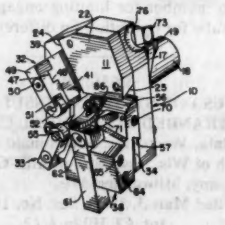
A manually operated unitary tool having a mandrel which is slidably inserted in a pipe end. The mandrel rotatably mounts a toolholder to which is connected a first blade causing bevelling of the pipe end as the toolholder is rotated. A second blade is mounted to the toolholder and squares the pipe end edge as the toolholder is rotated. The end result after utilizing the present tool is a finished bevelled pipe end which is easily inserted into a mating pipe end or fitting to form a joint.

3,636,804
MACHINE TOOLS
Raymond Allen Wyles, Windsor, Berkshire, England, assignor to William Owen McKenzie Jones, Hurley, Berkshire, England
Filed June 20, 1969, Ser. No. 835,199
Claims priority, application Great Britain, June 20, 1968, 29,486/68
Int. Cl. B23b *25/06*
U.S. Cl. 82—21 5 Claims



A rotatably indexable tool-programming drum for use in a machine tool having a rectilinearly reciprocal tool carrying assembly movable exteriorly over the length of the drum which carries one or more removable strip members having plural outwardly projecting and selectively positioned block members therealong, one of which has an end surface engageable with stop means on the tool carrying assembly for limiting the stroke of the assembly; the second of which has an outer cam surface engageable with follower means on the assembly and actuatable for changing the rate of rectilinear movement of the assembly from rapid traverse to tool feed rate, and a third of which carries adjustable projections engageable with means actuated thereby for regulating the rotational speed of a workpiece in the machine tool and the feed rate of a work tool engaged with the workpiece; each strip member being removable from the drum for presetting of the block members in predetermined relative positions remotely of the machine tool as determined by a predetermined operating program and movements for an associated work engaging tool.

3,636,805
SINGLE-SETTING TURNING TOOL
Henry J. Somma, and Herman R. Somma, both of Waterbury, Conn., assignors to Somma Tool Company, Inc., Waterbury, Conn.
Filed Sept. 30, 1969, Ser. No. 862,370
Int. Cl. B23b *29/16*
U.S. Cl. 82—35 6 Claims



The invention is directed to a turning tool, particularly for automatic screw machines, which includes novel features of

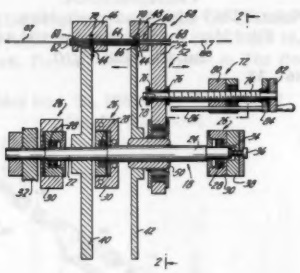
design and construction facilitating the initial step-up of the tool and also its adjustment in use. One of the inventive features includes the arrangement for effecting simultaneous inward or outward adjustment of a cutting tool and two backup elements associated therewith, and at the same time, providing a simplified independent adjustment of the cutting tool, through a limited range, where it is desired to burnish the workpiece while it is being cut. The burnishing effect is achieved by the manipulation of a special control lever, which adjusts the cutting element without affecting the other adjusted settings of the tool, and manipulation of the lever back to its original position resets the tool for cutting in the normal way. The device includes a novel chip breaker element, adjustably mounted on the tool body and having a first operative position in which it forms a center setting stop for the cutting tool, and a second operative position in which it functions in its customary manner as a chip breaker during the cutting operation. The new turning tool also has additional desirable features for improved convenience in use and greater accuracy in cutting.

3,636,806

MULTIPLE ACTING CUTTER WITH ADJUSTABLE FEATURES

Johan Vyncke, Mariakerke Gent, Belgium, assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed Mar. 2, 1970, Ser. No. 15,750
Int. Cl. B26d *5/08*
U.S. Cl. 83—355 **5 Claims**



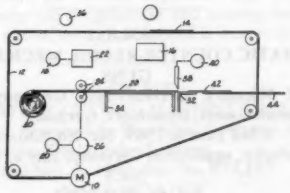
A cutoff device adapted to sever running lengths of stock material to length which includes a plurality of rotating cutting members that are adjustable with respect to one another. A telescoping material guideway is also provided as a part of the cutting member anvils and the anvil associated with the movable cutting member is similarly and simultaneously movable with that member.

3,636,807

COPY MACHINE PAPER CONTROL CIRCUIT

Richard E. Unangst, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed July 2, 1969, Ser. No. 838,416
Int. Cl. G03g *15/00*
U.S. Cl. 83—203 **8 Claims**



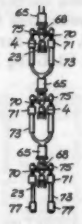
A length of copy paper is automatically drawn by a feed roll from a supply roll precisely measured and cut therefrom for merger with an original to be copied, by an integrated high-speed electronic control system in which movement of the original past an edge-sensor by a constant-speed motor starts the paper feed by closure of a feedroll clutch to the motor and the release of a feedroll brake, which feed continues at constant speed until the sensor initiates stoppage thereof by the application of the brake, opening of the clutch, and the paper cutting action of a knife, so that the so-cut length of copy paper corresponds substantially precisely to that of the original prior to subsequent copying of the original. A solid-state control circuit employing three storage capacitors and two commutating capacitors, is used to operate the three main elements of the system with such precise timing accuracy that a maximum variation of ± 1/64 inch in length is obtained with a paper feed speed of 5 to 60 feet per minute.

3,636,808

MATERIAL-CUTTING MACHINE

Hiroshi Taminaga, 78, Matsugaoka, Kanagawa, Yokohamashi, Kanagawa-ken, Japan

Original application Mar. 12, 1969, Ser. No. 806,646, now Patent No. 3,596,650. Divided and this application Mar. 17, 1971, Ser. No. 125,233
Int. Cl. 83 *639*; B26d *5/12, 11/00*
U.S. Cl. 83—514 **4 Claims**



An apparatus for cutting off metallic material and the like with the application of shearing force which comprises cutting means including a cutting tool which is actuated by the energy in the form of fluid pressure conveyed instantaneously through fluid from a high-pressure generator, and at least one of other means, namely, work-holding means capable of holding the work with an adequately strong force, compression means capable of exerting a compressive force on the work in the direction normal to the shearing direction, and means for regulating the speed at which the cutting tool operates, said cutting means and said one of means being combined together to constitute cutting functional means which can instantaneously cut off a work of metallic material or the like with a great composite shearing force, not with the simple shearing force of conventional shears.

ERRATUM

For Class 84—1 see:
Patent No. 3,636,801

3,636,809

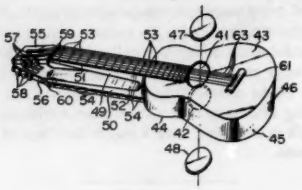
STRINGED MUSICAL INSTRUMENT

Hideyuki Ezaki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed July 7, 1970, Ser. No. 52,842
Claims priority, application Japan, July 10, 1969, 44/54439
Int. Cl. G10d *1/00, 1/08*
U.S. Cl. 84—263 **3 Claims**

A stringed musical instrument comprises one sound box having two sound boards each provided with a sound hole

and a sidewall joining the sound boards, two necks provided for the sound boards respectively, two heads connected to the necks, two seal caps for closing the sound holes, and



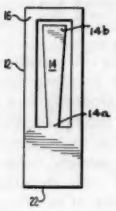
strings stretched between the heads and the sound boards, whereby musical tones having a variety of tone colors can be produced on both sides of the sound box.

3,636,810

TUNING FORKS AND OSCILLATORS EMBODYING THE SAME

William E. Reefman, Santa Barbara, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed July 23, 1969, Ser. No. 843,923
Int. Cl. G10g *7/02*
U.S. Cl. 84—457 **8 Claims**



A tuning fork assembly fabricated from a flat strip of material with the tines being formed by the removal of a portion of the strip so that the longitudinal axis of each tine lies in a plane which is substantially orthogonal to the directions in which the tines move during normal operation of the fork. A compliant base portion readily responds to and actuates drive and pickup transducers and for the purpose of reducing or cancelling spurious signals in the pickup transducer caused by unwanted ambient vibrational forces acting upon the fork, an auxiliary pickup is electrically connected in out-of-phase relationship to the main pickup.

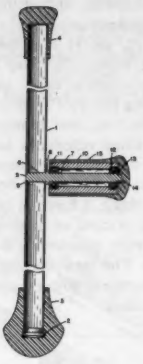
3,636,811

TWIRLING BATON

Jack L. Bailey, 115 Cooper Circle, Oak Ridge, Tenn.

Filed July 30, 1970, Ser. No. 59,426
Int. Cl. G09b *15/02*
U.S. Cl. 84—477 B **4 Claims**

A twirling baton with a sturdily mounted side handle to enable a novice, as well as a professional, to twirl the same for long periods of time with little effort or attention. In one embodiment, the handle is removable so that the baton may be twirled in a normal manner. One end of the baton is



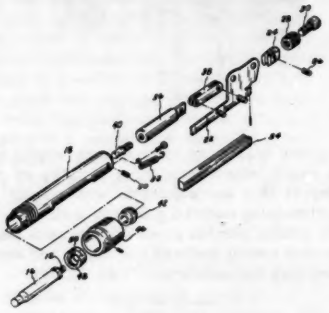
weighted to increase momentum during twirling, and the handle includes bearings to reduce friction.

3,636,812

PRIMING TOOL

John N. Nuler, 12869 Dixie St., Detroit, Mich.

Filed Mar. 5, 1969, Ser. No. 804,445
Int. Cl. F42b *33/10*
U.S. Cl. 86—33 **1 Claim**



A handtool having a shell holder for clamping the head of an ammunition case on the tool to align the primer pocket of the case with a punch. The punch is advanced in an adjusted motion to press each primer a uniform depth into the pocket of each case regardless of variations in the rim thickness between cases.

3,636,813

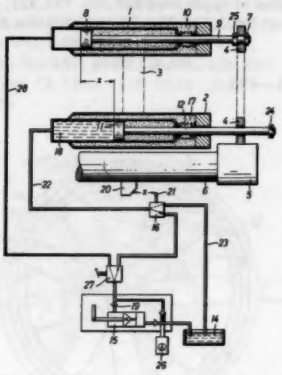
PNEUMATIC COUNTER-RECOIL MECHANISM FOR GUNS

Karl-Josef Wiemers, Grevenbroich, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed June 4, 1969, Ser. No. 830,451
Claims priority, application Germany, July 6, 1968, P 17 03 764.8
Int. Cl. F41f *19/12*
U.S. Cl. 89—43 R **3 Claims**

A pneumatic counter-recoil mechanism for guns, which comprises two counter-recoil cylinders operatively connected

in parallel arrangement, and means are provided for operatively securing the cylinders to the gun. One of the cylinders partly effects the counter-recoil and the other of the cylinders includes means for feeding separately and storing a part of the energy required for the counter-recoil stroke of the barrel.

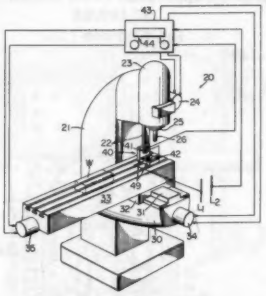


3,636,814

APPARATUS FOR AND METHOD OF CHECKING A TOOL OF A NUMERICALLY CONTROLLED MACHINE

Robert E. Esch, Dayton, Ohio, assignor to The Bendix Corporation

Filed Nov. 26, 1969, Ser. No. 880,039
Int. Cl. B23c 9/00
U.S. Cl. 90—11 R 22 Claims



A switch apparatus is provided and mounted on a numerically controlled machine having a programmer and a tool mounted in an associated tool holder. The tool holder with its tool and switch apparatus are relatively moved in operative association by moving means comprising the machine in accordance with a predetermined sequence provided by the programmer and the switch apparatus and programmer cooperate to stop the programmer and moving means in the event the size and/or setting of the tool is incorrect.

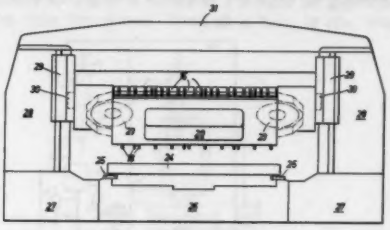
3,636,815

SURFACE CUTTING MACHINE TOOL

Walter Koehler, Guetersloh, Westfalen, Germany, assignor to IMA Klessmann, Guetersloh, Germany

Filed Nov. 5, 1969, Ser. No. 874,107
Int. Cl. B23d 1/18
U.S. Cl. 90—38 6 Claims

This invention is directed to a planar type of machine tool in which a plurality of cutting tools are individually mounted on the respective links of continuously driven endless chain that is bodily oscillatable about an axis transverse to the path of travel of the workpiece so that the cutting tools on one flight of the chain engage the workpiece during one direction of travel thereof and the cutting tools on the other flight of the chain engage the workpiece during its opposite direction of travel. The workpiece is progressively pivoted in one direction as it is advanced and progressively pivoted in the opposite directions as it is returned so that the tool cuts will be in straight lines substantially parallel to the sides of the workpiece.

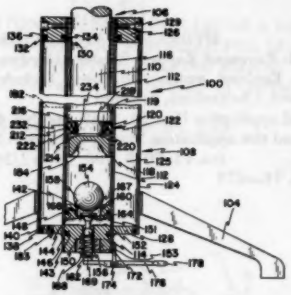


3,636,816

POWER UNIT FOR A STOOL AND THE LIKE

Dean H. Hale, 2500 North Main, Logan, Utah

Filed Apr. 15, 1970, Ser. No. 28,837
Int. Cl. F15b 21/04; F16j 9/08
U.S. Cl. 91—4 R 3 Claims



A power unit for a stool and the like. The stool may comprise a seat mounted upon a vertical post comprising the power unit, having upper and lower parts, the post being secured to a base. The power unit has a ram which telescopes within a cylinder. The power unit further comprises a reservoir containing oil under pressure of compressed air which can be used to change the effective length of the power unit. A flow control valve and a lever controls the flow of the oil between the reservoir and the cylinder so as to regulate the mentioned effective length. The reservoir and the valve are disposed at one end of the power unit. An improved seal having a center portion and flared inner and outer lips is used to seal parts of the power unit so as to prevent leakage of air or oil.

3,636,817

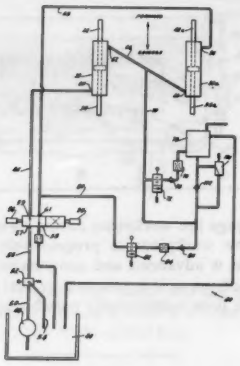
HYDRAULIC CONTROL SYSTEM FOR CROSSER MACHINE

Sumner Shapiro, Delmar, N.Y., assignor to Star Textiles & Research, Inc., Cohoes, N.Y.

Filed Aug. 14, 1969, Ser. No. 850,060
Int. Cl. F01b 25/04, 31/12; F15b 13/044
U.S. Cl. 91—171 8 Claims

An improved crosser machine is provided including a continuous apron driven by two spaced-apart reciprocating arms

that are adapted to move together through the action of separate hydraulic cylinders. The crosser includes a control mechanism for maintaining the alignment of the apron including valve means adapted to bleed small quantities of hydraulic fluid from the hydraulic lines as required to bring



the arms into alignment in the event one arm leads the other, and sensing means to determine the relative positions of the arms and to control the valve means. The crosser serves to lay alternate layers of a web back and forth over itself to build up a thickness of the web material.

3,636,818

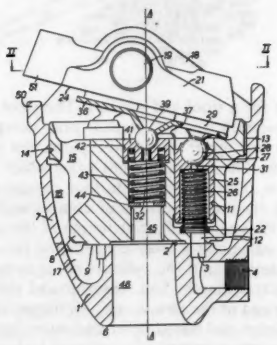
HYDRAULIC APPARATUS

Kenneth Raymond Boydell, Bredons Hardwick, near Tewkesbury, England, assignor to Dowty Technical Developments Limited, Cheltenham, England

Original application Dec. 29, 1967, Ser. No. 694,717. Divided and this application May 1, 1970, Ser. No. 33,720

Int. Cl. F01b *3/00*; F04b *1/26*

U.S. Cl. 91—475 **7 Claims**



A swashplate pump comprising a rotary cylinder block having cylinders disposed parallel to or inclined to the rotation axis and rotating on a valve, a swashplate adjacent the cylinder block to engage slippers attached to pistons which project from the cylinders in the cylinder block, and a central spring acting on a slipper plate which engages all slippers and urges them to the swashplate. The swashplate is supported by trunnion means whereby the swashplate may tilt to vary the stroke of the pistons in the cylinders and the trunnion means is so located that tilting movement of the swashplate to increase piston stroke will also increase the compression of the central spring thereby to increase the spring loading exerted by the slipper plate on the slippers.

3,636,819

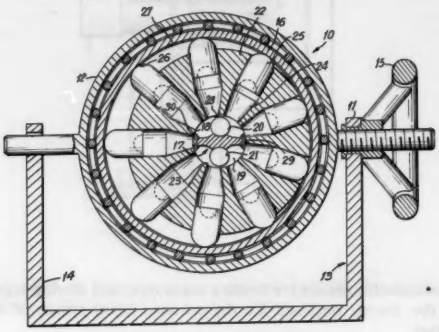
LEAK REDUCING RADIAL PISTON PUMP OR MOTOR

Jaromir Tobias, Box 141, Road #2, Rhinebeck, N. Y.

Continuation of application Ser. No. 795,325, Jan. 30, 1969, now Patent No. 3,520,233. This application Apr. 24, 1970, Ser. No. 31,680

Int. Cl. F04b *1/24*

U.S. Cl. 91—498 **2 Claims**



A radial piston pump or motor having means for reducing leakage across the pintle lands.

3,636,820

HYDRAULIC APPARATUS

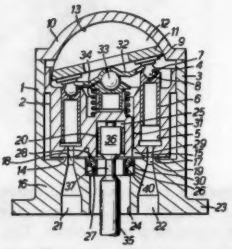
Dennis Ernest Lambeth, Benhall, Cheltenham, England, assignor to Dowty Technical Developments Limited, Brockhampton, Cheltenham, England

Filed July 2, 1969, Ser. No. 838,607

Claims priority, application Great Britain, July 5, 1968, 32,109/68

Int. Cl. F04b *1/20*

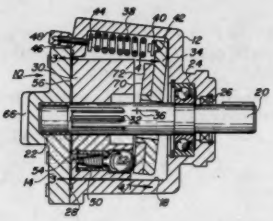
U.S. Cl. 91—499 **1 Claim**



A hydraulic pump or motor intended to fit on an engine or the like for connection to a drive shaft carried in bearings in the engine or the like. The pump comprises a rotary cylinder block having a plurality of cylinders either parallel to or inclined to the rotation axis. Pistons in the cylinders are reciprocable during block rotation by means of a swashplate at one end of the block. The cylinder block is mounted for rotation in a bearing which directly absorbs the side thrust exerted on the block through the pistons. Liquid is introduced to and taken from the pump through a valve having a flat valve surface located at the end of the block remote from the swashplate. An opening is defined by an aperture in the valve and a blind hole in the block to receive the shaft from the engine or the like and an annular sealing device is mounted between the valve member and the block concen-

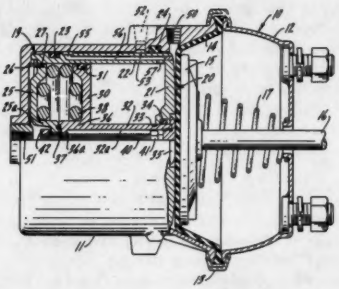
tric with the opening, the sealing device being capable of accommodating axial and tilting movement of the block.

3,636,821
VARIABLE DISPLACEMENT DEVICE
Charles H. Rystrom, 696 Oak St., Winnetka, Ill.
Filed Sept. 10, 1969, Ser. No. 856,694
Int. Cl. F04b *1/20*; F01b *13/04*
U.S. Cl. 91—504 3 Claims



A positive displacement hydraulic device such as a pump or motor includes a plurality of hydraulically balanced ball piston actuators and pistons which are controllably reciprocated in cylinder bores by a tile plate having a circular groove in which the piston actuator balls roll, the groove having a pair of diametrically opposed depressions disposed opposite to the respective lands in the port plate.

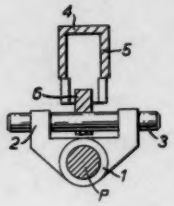
3,636,822
DUAL LINE BRAKE
Charles Horowitz, Niles, Ill., assignor to The Berg Manufacturing Company, Des Plaines, Ill.
Filed Apr. 6, 1976, Ser. No. 25,954
Int. Cl. F01b *7/20*
U.S. Cl. 92—63 4 Claims



A vehicle brake actuator having a first movable wall responsive to a first supply of fluid pressure to apply the brakes and a second movable wall responsive to a second, independent supply of fluid pressure to apply the brakes.

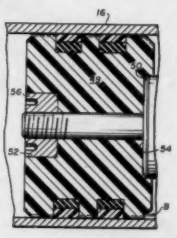
3,636,823
HERMETICALLY SEALED MOTOR-COMPRESSOR APPARATUS
Ronald W. Lewis, and Eric Smith, both of Bognor Regis, England, assignors to Lec Refrigeration Limited, Bognor Regis, Sussex, England
Filed June 22, 1970, Ser. No. 48,067
Claims priority, application Great Britain, Apr. 13, 1970, 18,897/70
Int. Cl. F16j *1/18*
U.S. Cl. 92—187 4 Claims

The present invention is concerned with improvements relating to hermetically sealed motor-compressor apparatus as used in the cooling systems of mechanical refrigerators. More particularly the invention relates to an improved reciprocating mechanism for linking or yoking a crankshaft to a compressor piston and according to the invention the cylindrical piston is provided with a protruding skirt having a crossmember to which is attached a tongue of appreciably less width than the piston. Through a bore in this tongue



there passes a slide shaft which constitutes a yoke little end, the said tongue being secured to the slide shaft, e.g., by a pin. The tongue width is small and clearance is provided between the edges of the skirt and sidearms associated with the yoke big end and receiving the slide shaft so that one assembly as described may do service for a wide variety of piston member diameters.

3,636,824
UNITARY PISTON ASSEMBLY INCLUDING A BODY MEMBER SERVING BOTH AS A HOLDER FOR SEALING RINGS AND AS PISTON-BEARING MEANS
Norman E. Clark, Newark, N.Y., assignor to Garlock Inc., Palmyra, N.Y.
Filed Jan. 13, 1970, Ser. No. 2,537
Int. Cl. F16j *1/02*
U.S. Cl. 92—249 4 Claims

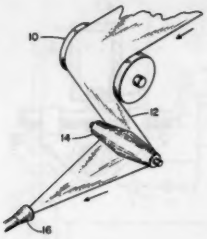


A single, ring-holding and bearing member is generally cylindrical and has one or more external parallel-walled grooves for separately carrying sealing rings. This unitary member is a mixture of nylon and mineral fibers which is substantially nonextrusive and capable of swelling under elevated temperature conditions but is substantially noncontractile irrespective of subsequent temperature conditions. Said member, at all axial points, is of substantial radial thickness and capable of swelling radially, upon initial operation, to establish and maintain a firm bearing engagement with the wall of a cylinder in which the piston operates. Such bearing engagement is firm enough to prevent extrusion of sealing rings which are of softer plastic material than the material of said member.

3,636,825
APPARATUS FOR CONVEYING WEBS

John Courtright Randall, and Marvin Roy Riek, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 6, 1969, Ser. No. 789,977
Int. Cl. B31d 5/02; B31f 1/00; B31c 5/00
U.S. Cl. 93—1 C 3 Claims

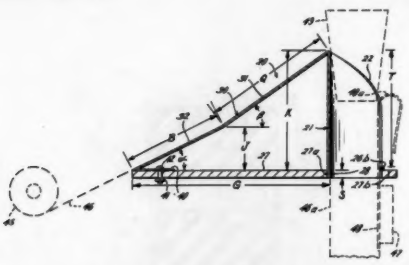


The uniformity of cigarette filters formed from coherent webs of filtration material is improved by feeding of the web about a convex idler roll just prior to feeding of the web into the garniture of a cigarette filter rod maker, and preferably feeding the web from the idler roll to the rod maker along the axis of the garniture.

3,636,826
FOLDING SHOE FOR USE IN A PACKAGING MACHINE

Burlie R. Bowen, and William L. Heemer, Jr., both of c/o General Packaging Equipment Co. P.O. Box 19525, Houston, Tex.

Filed Oct. 24, 1969, Ser. No. 869,224
Int. Cl. B31b 1/42; B65b 9/00
U.S. Cl. 93—59 R 35 Claims



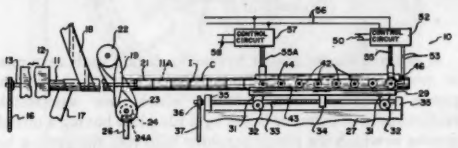
Flexible sheet material made of plastic, paper, metal foil, or the like is pulled off of a supply roll and passed over and through the folding shoe for forming packages or bags for holding various types of products. In one embodiment, the folding shoe includes a truncated tubular portion and a skirt portion surrounding such tubular portion and joined to the inclined throat formed by the truncated end thereof. Such skirt portion includes a sloping tail section extending outwardly from the high side of the throat for guiding the sheet material thereto. Such sheet material is then pulled downwardly through the throat and the tubular portion to fold it into a tubular form having an overlapping seam which is sealed as the tubular form leaves the folding shoe. After sealing the tubular form in a transverse or crosswise manner, the desired product can be loaded into the resulting tubular package by way of the passage through the tubular portion of the folding shoe, after which the package is transversely sealed above the product load and cut or severed from the folded sheet material then emerging from the folding shoe.

In another embodiment, the tubular portion of the folding shoe is omitted and only the skirt portion is used. In a further embodiment, most of the skirt portion is omitted, only the outer part of the tail section being used, such part being held in a spaced-apart relationship with respect to the tubular portion. In any of these various embodiments, the folding throat can be shaped to fold the sheet material into either a round or an obround or a flat form.

3,636,827
APPARATUS FOR DISTRIBUTING ERRORS IN THE FORMATION OF HELICALLY WOUND CONTAINER BODIES

Richard C. Lindberg, Skokie, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed June 24, 1970, Ser. No. 49,214
Int. Cl. B31c 1/00
U.S. Cl. 93—80 5 Claims



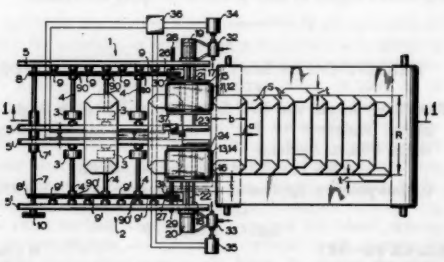
In the formation of helically wound containers by first winding a "stick" consisting of connected container bodies, the error in each body accumulates throughout the length of the "stick." The error in each body is confined to such body by properly positioning each of an array of cutters, so as to sever the connected bodies into discrete bodies each having the individual error therein. The error in each body is readily accommodated in conventional closing machines, and there is no need to waste a trim ring when each stick is formed. All container bodies are thus identical in appearance, especially important when a label is helically wound.

Each of the cutters is mounted on a carriage movable along a pinion axis indexed to an error-distributing position, the pinion moving between a pair of racks engaging a group of such error-correcting pinions. The latter are each spaced a distance corresponding to the proper length of the container body plus or minus the error therein. The pitch diameter of the pinions varies from a minimum to a maximum according to the error accumulating in the formation of the stick.

3,636,828
CONVEYING APPARATUS

Fritz Achelpohl, Lengerich (Westphalia), Germany, assignor to Windmoller & Holscher, Lengerich (Westphalia), Germany

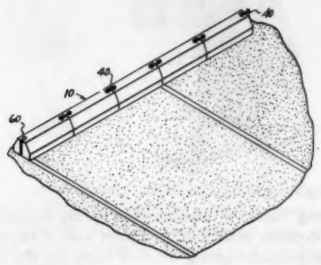
Filed Oct. 9, 1968, Ser. No. 766,079
Claims priority, application Germany, Oct. 11, 1967, P 16 11 703.6
Int. Cl. B31b 1/96; B65b 57/20, 65/08
U.S. Cl. 93—93 K 6 Claims



Method and apparatus for indexing a predetermined number of flat articles which form a group within a continu-

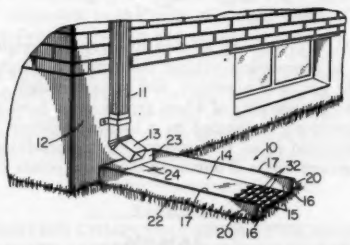
ous series of such articles being conveyed by counting the articles, with means provided therefor, as they are conveyed until the predetermined number in the group is reached and then displacing, with means provided therefor, one of the articles, either the first or the last in the group, a short distance transverse to the direction of conveyance so that it extends laterally beyond one side of the series of articles.

3,636,829
PARKING BARRIER
Sherwin Palmer, 1711 Woodslea Drive, Flint, Mich.
Filed Dec. 24, 1969, Ser. No. 887,906
Int. Cl. E01c *11/22*
U.S. Cl. 94—31 **3 Claims**



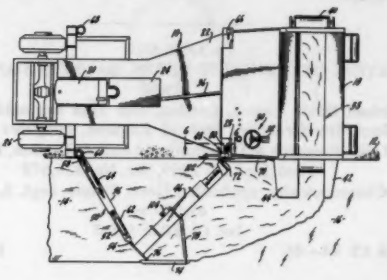
An elongated bumper or curbing unit fabricated from poured concrete or the like for installation in multiples to provide a wall or border consisting of a series of individual units arranged and interconnected in an end-to-end relationship. Each curbing unit includes a vertically disposed cylindrical aperture formed adjacent each end thereof and a vertical slot connecting each of the apertures with its adjacent end. The curbing units are securely anchored to the ground and interconnected to each other by elongated generally U-shaped channel members which are inserted into the slots and apertures of adjacent curbing units and have a portion driven into the ground.

3,636,830
DRAIN TROUGH
Richard M. Watts, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Jan. 29, 1970, Ser. No. 6,740
Int. Cl. E01c *11/24*; E02b *9/04*
U.S. Cl. 94—33 **7 Claims**



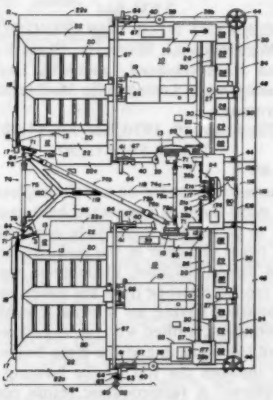
A sheet metal downspout drain trough is disclosed having an open front for drainage of water therethrough and having a bottom wall, a backwall, and a pair of sidewalls foldably connected to opposite side edges of the bottom wall. Each of the sidewalls has a top ridge and an extension which extends downwardly from the top ridge and outwardly of its associated sidewall to define a supporting leg for the trough. Integral anchoring means is provided on at least one of the supporting legs for anchoring the trough to the ground beneath an associated downspout and integral anchoring tongues may also be provided extending from the bottom wall to anchor the front end of the drain trough in position.

3,636,831
PAVEMENT WIDENER
Donald R. Davin, Shelbyville, and Michael E. Grant, Charleston, both of Ill., assignors to Blaw-Knox Construction Equipment, Inc., Mattoon, Ill.
Filed Sept. 24, 1969, Ser. No. 860,584
Int. Cl. E01c *19/22*
U.S. Cl. 94—45 R **9 Claims**



A method and apparatus for depositing paving material in a widened course alongside an existing paved surface. Material deposited in a hopper of the apparatus is conveyed to one side and spread onto the course where a strikeoff blade levels the material to the desired width, grade and slope. A control circuit is provided to automatically control grade and slope in relation to predetermined reference datums. A grade sensor responsive to a first datum actuates the circuit to elevate or depress the inboard end of the blade for grade control, and a grade sensor responsive to a second datum actuates the circuit to elevate or depress the outboard end of the blade for slope control. In one form of the invention the second datum is the gravity force vector, and in another form this datum is the slope of the paved surface.

3,636,832
DUAL PAVER
Vernon L. Schrimper, and Louis F. Fairchild, both of Cedar Rapids, Iowa, assignors to Iowa Manufacturing Company of Cedar Rapids, Cedar Rapids, Iowa
Filed Mar. 10, 1970, Ser. No. 18,106
Int. Cl. E01c *19/48*
U.S. Cl. 94—46 **28 Claims**



A dual paver is composed of the tractors of a pair of typical single pavers, the tractors being linked in spaced side-by-

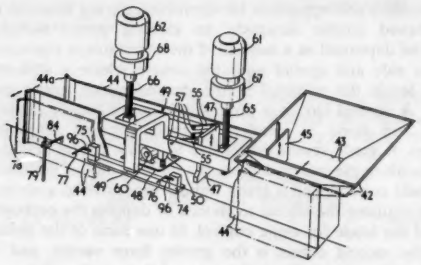
side relation and fitted across their rear with a single-screed assembly of the floating type. Two types of the screed assembly are shown, one, an elongated rigid screed formed from the two individual screeds and a special rigid center section with a central crowning mechanism, and the other a "split" screed, also formed from the two individual screeds but with a center section made up of two standard screed extensions resiliently secured to each other. The controls of each tractor are tied into a dual control console mounted on one tractor so that both can be conjointly operated as a unit. Various applications of automatic screed-leveling devices are also disclosed in combination with both types of screed assemblies.

3,636,833

LAYING OF CONCRETE KERBS, HAUNCHES AND THE LIKE

Michael David Lowen, London, and Alan Reginald Mountford, Hertfordshire, both of England, assignors to John Laing Research & Development Limited, London, England

Filed June 24, 1969, Ser. No. 836,078
Claims priority, application Great Britain, Sept. 3, 1968, 41,939/68
Int. Cl. E01c *19/48*
U.S. Cl. 94—46 **18 Claims**



Concrete is laid to a surface defined by a datum wire extending e.g. over rough ground by a machine including a mobile carriage with a concrete hopper feeding concrete between slip forms in a controlled fashion using a gate vertically movable in dependence on the movement of sensing devices touching the wire. Smoothing devices one mounted on a subframe of the machine for vertical movement also in dependence on the sensing devices.

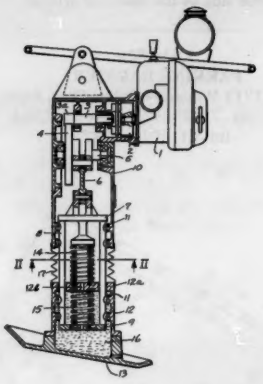
3,636,834

IMPLEMENT WITH VIBRATING TOOL

Hans-Georg Waschulewski, Mettmann; Hans Baumers, Hubbelrath, and Hans-Reinhard Lambertz, Hochdahl, all of Germany, assignors to Losenhausen Machinenbau AG, Dusseldorf, Germany

Filed Nov. 19, 1970, Ser. No. 91,021
Int. Cl. E01c *19/30*
U.S. Cl. 94—49 **5 Claims**

A prime mover is mounted on a main implement frame. A crank in the main frame is connected by a gear drive to the prime mover to be rotated thereby. In one embodiment, the crank is in a lower chamber in the main frame and the gear drive is in an upper, oil-filled, chamber in the main frame. Positioned a spaced distance from the lower end of the main frame is a housing having an internal chamber which, in another embodiment, is filled with oil. A bellows encloses the space between the housing and the main frame. An oil aperture extends through the top of the housing to the space within the bellows. A reciprocating frame comprises three rods supported by rollers for longitudinal movement in the lower chamber of the main frame and in the upper, adjacent, wall of the housing. The rollers are on the outside of the rods and are grooved to fit the rods. The rods are positioned 120° apart. The reciprocating frame has a crossmember within the main frame at the upper ends of the rods, and a plate within the housing at the lower ends of the rods. The upper crossmember is connected to the crank so as to reciprocate the



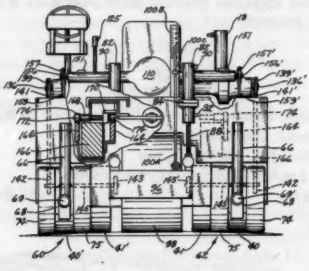
reciprocating frame. A compression spring extends between the upper crossmember and the upper wall of the housing. A second compression spring extends between the upper wall of the housing and the plate in the housing. The bottom of the housing forms a tamping foot.

3,636,835

COMPACTION VEHICLE

Vernon H. Reisser, 10617 Poppleton Ave., Omaha, Nebr.

Filed May 5, 1969, Ser. No. 821,624
Int. Cl. E01c *19/26*
U.S. Cl. 94—50 R **8 Claims**



A vehicle containing an area to carry the weight of substance, a compaction vehicle containing a weight box to carry the weight of substance, and movable weight containers and having a plurality of wheel groups being hoist supported and operatively connected by a hydraulic circuit to create predetermined equal and unequal loading conditions on the wheel groups while maintaining the three points of suspension.

3,636,836

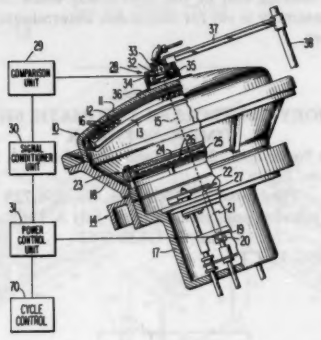
PHOTOGRAPHIC PROCESS FOR PREPARING A SCREEN STRUCTURE FOR A CATHODE-RAY TUBE

William Joseph Maddox, and Morris Robert Weingarten, both of Lancaster, Pa., assignors to RCA Corporation

Filed June 1, 1970, Ser. No. 42,322
Int. Cl. G03
U.S. Cl. 95—1 **5 Claims**

A process for preparing a screen structure for a cathode-ray tube of the aperture-mask type comprising placing the

panel assembly including the aperture mask on a lighthouse and unshuttering the light source, thereby projecting light through the mask incident on the panel. During the exposure and after a delay following unshuttering, preferably of at least 0.4 seconds, a portion of the light transmitted through



the mask is continuously measured, and the light source is continuously adjusted to produce a total luminous flux on the film. In a preferred form of the novel process, the intensity level of the incident light is restored to a predetermined intensity value after the exposure.

3,636,837

LIGHT BEAM INFORMATION PRESENTATION CONTROL MEANS

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif.

Filed Jan. 7, 1970, Ser. No. 1,102

Int. Cl. B41b *13/00*

U.S. Cl. 95—4.5 **6 Claims**

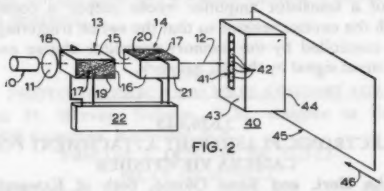


FIG. 2

Apparatus for controlling the formation and presentation of messages utilizing the high-speed light deflection characteristics of electro-optic light-refractive materials in combination with a longitudinally extended window of a light-limiting member supported in the path of a light beam. The light beam is deflected vertically and allowed to enter the window whereby a series of vertically oriented side-by-side lines of light may be exposed to the surface of a display medium. But, in the process of doing so, the light beam will be deflected horizontally and beyond the limits of the window so as to effect interruptions in lines of the series which correspond to the formation requirements of a message being presented.

3,636,838

BEAM MOTION COMPENSATION IN OPTICAL IMAGE TRANSFER SYSTEMS HAVING MOVING PARTS

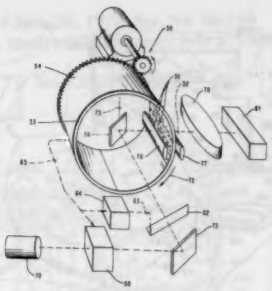
David C. Chang, Pleasant Valley, and James Lipp, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 4, 1969, Ser. No. 813,446

Int. Cl. B41b *17/12*

U.S. Cl. 95—4.5 **15 Claims**

A static electro-optic crystal deflection element, subject to electrical control of refraction, is used as an inertialess compensating element in mechanically controlled projection systems for laser beams. Electrical signals derived from the moving parts of the control mechanism are applied to the crystal to produce compensating refractions of the laser coordinated with short increments of movement of the mechanism. In one application blurring effects associated



with continuous rotation of a multifaceted deflection mirror in a photographic tracing system are nullified by electro-optic compensation. In another application distortion due to relative motion between a sensing laser and a rotating drum containing a series of hologram records is cancelled by electro-optic effects coordinated with individual record movements.

3,636,839

ELECTRONIC SHUTTER CAMERAS WITH OCCLUDED LIGHT-MEASURING SYSTEMS

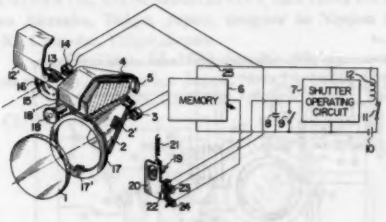
Masaru Yamamoto, Sagamihara, Japan, assignor to Yashica Company, Limited, Tokyo, Japan

Filed Aug. 21, 1970, Ser. No. 65,847

Claims priority, application Japan, Aug. 27, 1969, 44/67181

Int. Cl. G03b *7/08, 9/62*

U.S. Cl. 95—10 CT **2 Claims**



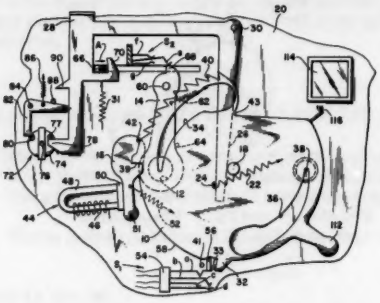
In an electronic shutter camera of the type wherein the light quantity transmitted through the objective lens of the camera is measured by an occluded photoelectric transducer element and stored in a memory device and a shutter-operating circuit responsive to the output from the memory device is used to determine the shutter time, there are provided a second photoelectric transducer positioned to receive light reflected by an object illuminated by a flashlamp or a stroboscope, and a transfer switch for transferring the shutter-operating circuit between the memory device and the second photoelectric transducer element when a flashlamp or stroboscope is mounted on the camera.

3,636,840

GENERATOR-POWERED EXPOSURE CONTROL

Donald M. Harvey, Webster, and George M. Inglis, Marion, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1970, Ser. No. 67,332
Int. Cl. G03b 7/08
U.S. Cl. 95—10 CE 6 Claims



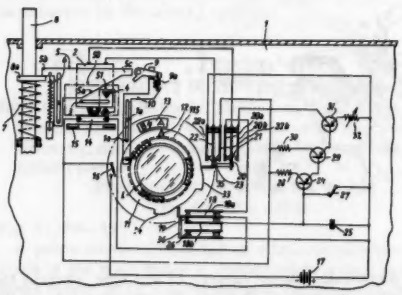
An exposure control system including a photoelectric control circuit for adjusting the exposure aperture and shutter speed of a camera, and a generator for energizing the circuit. To reduce the power requirements on the generator, the system preferably is adapted to adjust the diaphragm with a fixed shutter speed in normal light conditions, and to adjust the shutter speed with a fixed diaphragm setting in low-light conditions.

3,636,841

PHOTOGRAPHIC APPARATUS WITH BUILT-IN EXPOSURE CONTROL ASSEMBLY

Karl Wagner, Ottobrunn, and Josef Ganser, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 26, 1971, Ser. No. 109,811
Claims priority, application Germany, Jan. 30, 1970, P 20 04 259.5
Int. Cl. G03b 7/04, 7/12, 9/58
U.S. Cl. 95—10 CT 15 Claims



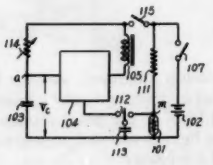
A photographic camera wherein the pointer of a moving-coil measuring instrument is scanned by a device which adjusts the diaphragm and/or the shutter when the exposure control assembly of the camera is set for automatic determination of exposure values. When the exposure control assembly is set for the making of exposures with a relatively long exposure time, the instrument is connected with the output of a circuit whose input is then connected with a timer including a photosensitive resistor and a capacitor which is charged by way of the resistor to cause the circuit to move the pointer to an end position when the capacitor is charged to a predetermined value. The user of the camera opens the shutter to thereby complete the circuit and observes the pointer to close the shutter when the pointer is caused to assume its end position. The photosensitive resistor is in circuit with the moving coil of the instrument when the exposure control assembly is set for automatic determination of exposure values.

3,636,842

MEMORY-CONTROLLED AUTOMATIC SHUTTER TIMING NETWORK

Tsukumo Nobusawa, 255, Minamiotzumi-machi, Nerima-ku, Tokyo-to, Japan

Filed June 26, 1969, Ser. No. 836,728
Claims priority, application Japan, July 3, 1968, 43/45877
Int. Cl. G03b 9/62
U.S. Cl. 95—10 CT 9 Claims



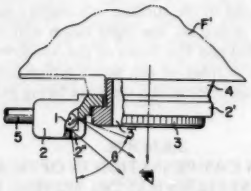
A memory-type shutter timing network comprises a solid-state switch controlling the shutter closure release and including a switching transistor and an emitter resistor. An RC network includes in series connection a variable resistor and a timing capacitor which is connected to the switch control input. A photoconductor and resistor are connected in series, and a memory capacitor connected through a camera controlled switch across the photoconductor is connected to the input of a transistor amplifier whose output is connected through the emitter resistor so that the switch triggering voltage is controlled by the memory capacitor charge and the switch input signal by the RC network.

3,636,843

ELECTRONIC FLASHLIGHT ATTACHMENT FOR CAMERA VIEWFINDER

Kunihiko Hori, and Keno Okuno, both of Kawasaki-shi, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Sept. 18, 1969, Ser. No. 858,977
Claims priority, application Japan, Sept. 24, 1968, 43/82035
Int. Cl. G03b 19/02
U.S. Cl. 95—11 R 1 Claim



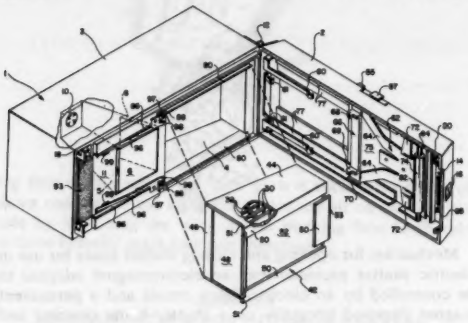
An attachment for rotatably mounting the pilot lamp of an electronic flashlight on the camera viewfinder eyepiece. By rotating the pilot lamp with relation to the viewfinder, the person using the camera can keep the pilot lamp within his field of vision while looking through the viewfinder, regardless of the position of the camera.

3,636,844

MECHANISM FOR USE IN A CAMERA FOR EXPOSING AND INITIATING THE PROCESSING OF PHOTOGRAPHIC UNITS

Leonard F. Kamp, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 17, 1970, Ser. No. 46,856
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 8 Claims



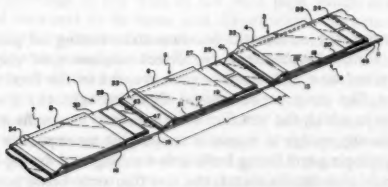
A mechanism for transporting and initiating the processing of "self-processing" film units in a camera that exposes and effects the processing of such units. The mechanism includes a reciprocable carriage which moves in a first direction over an exposed unit to release and spread processing solution across the unit, and in a return direction to transport a fresh unit from a supply chamber into position for exposure, while ejecting the exposed unit from the camera. The carriage is guided by cooperating rails both to prevent the premature release of processing reagent on film units in the supply chamber, and to effect transporting engagement between the carriage and the fresh unit when the carriage is moved in the return direction.

3,636,845

PHOTOGRAPHIC FILM UNIT ASSEMBLAGE

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1970, Ser. No. 77,512
Int. Cl. G03d *17/52*
U.S. Cl. 95—13 24 Claims



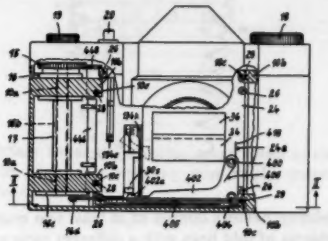
An improved assemblage of integral self-processing film units interconnected by a unit-transporting web is disclosed wherein the length of web material between succeeding film units is approximately one-half the length of web material found between such units in prior assemblages of this type. The assemblage is adaptable to being arranged with its film units stacked in superposed relationship while being operably interconnected by the unit-transporting web for ready use in cooperating photographic apparatus. When the film units are so stacked, each unit in the stack is connected by the interconnecting web from a point that is located along the length of that unit forward of its trailing end, such as its midpoint or its leading end or a point forward of its leading end, to the leading end of the next succeeding unit immediately below that unit.

3,636,846

SINGLE LENS REFLEX CAMERA WITH FOCAL PLANE SHUTTER UNIT

Franz Singer, Munich, Germany, assignor to Compur-Werk Gesellschaft mit beschrankten Haftung & Co., Munich, Germany

Filed June 26, 1970, Ser. No. 50,150
Claims priority, application Germany, July 1, 1969, P 19 33 365.4
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 5 Claims



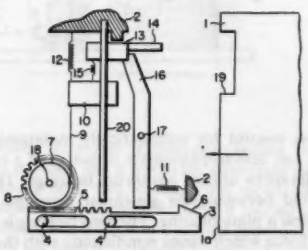
A photographic camera of the single lens reflex-type with a focal plane shutter, in which the shutter is part of a preassembled unit which also includes the pivoted mirror and the interacting connections between the mirror and the shutter mechanism to insure operation of the swinging mirror in proper timed relation to the operation of the shutter slides or blades. This eliminates the assembling difficulties frequently encountered in prior cameras of the same general type, in which the mirror and its operating mechanism are customarily assembled on the camera body before the focal plane shutter unit is installed, the assembly of the proper connections between the shutter unit and the mirror and other parts mounted on the camera body being frequently quite troublesome.

3,636,847

AUTOMATIC FILM SENSITIVITY SETTING DEVICE

Shigeo Akasaka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Chuo-ku, Tokyo, Japan

Filed Nov. 17, 1970, Ser. No. 90,321
Claims priority, application Japan, Nov. 25, 1969, 44/111462
Int. Cl. G03b *19/18*
U.S. Cl. 95—31 FS 7 Claims



An automatic film sensitivity setting device for a camera using a film container having at its periphery signal means representing the sensitivity of a self-contained film, and providing a sensing member for an exposure meter within the

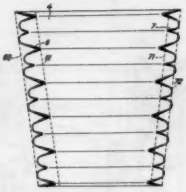
camera connectable to said signal means. When the film container is mounted on the camera, the film sensitivity of the film container is introduced into the exposure meter.

3,636,848

FOLDLINE BELLOWS

Jiri Mazur, Prerov, Czechoslovakia, assignor to Meopta Preror

Filed July 27, 1970, Ser. No. 58,589
Claims priority, application Czechoslovakia, Aug. 8, 1969, PV5512-69
Int. Cl. G03b *17/04*
U.S. Cl. 95—39 **5 Claims**



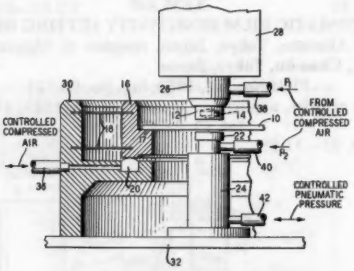
The foldline bellows consist of at least two mutually interposed systems of fold lines with a different ratio of the depth of the fold lines and with different thicknesses of individual parts of the walls of both systems. At maximum collapse some foldlines of both systems are staggered so that they require less space than ordinary bellows. They can be made of plastics and can have any arbitrary, for example, circular or square cross section and the form of a cylinder or a cone.

3,636,849

AUTOMATIC FOCUS CONTROL FOR A CAMERA

David Shepard Alles; John William Elek, both of Wescoesville; Benjamin Edward Nevis, Bethlehem, and Wallace Albert Schlegel, Bath, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 28, 1970, Ser. No. 6,438
Int. Cl. G03l *3/00*
U.S. Cl. 95—45 **6 Claims**



A focus control for automatically maintaining the focus distance, i.e., lens-to-photoplate distance, of a camera within small tolerances utilizes gas-thrust bearings. The photoplate is mounted between two gas-thrust bearings called a lens bearing and a plate bearing. The lens bearing is very stiff and exerts a force which varies significantly with the float height; whereas, the plate bearing is very soft and exerts a force which is essentially independent of float height. Photoplate surface contours or irregularities are accommodated by a change in float height of the plate bearing while a substantially constant lens-to-photoplate surface distance is maintained by the stiff lens bearing.

3,636,850

SHUTTER OPERATOR USING PERMANENT AND ELECTROMAGNETS

Tomio Kikuchi, and Kiyoyuki Arai, both of Saitama-ken, Japan, assignors to Kabushiki Kaisha Koparu, Itabashi-ku, Tokyo, Japan

Filed Apr. 1, 1969, Ser. No. 812,092
Claims priority, application Japan, Apr. 24, 1968, 43/27557
Int. Cl. G03b *7/08, 9/62*
U.S. Cl. 95—53 E **4 Claims**

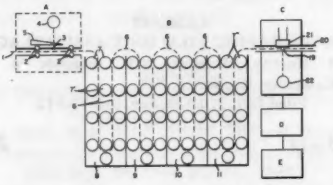
Mechanism for opening and closing shutter blade for use in electric shutter provided with an electromagnet adapted to be controlled by an electric delay circuit and a permanent magnet disposed integrally on a shutter blade opening and closing member, said two magnets being arranged so as to be able to face each other with reverse polarity, whereby the opening and closing of the shutter blade can be effected with accuracy and speed.

3,636,851

APPARATUS FOR AUTOMATIC FILM TESTING

Karl-Heinz Furst, Gotzenhain, Germany, assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 8, 1969, Ser. No. 864,730
Claims priority, application Germany, Nov. 7, 1968, P 18 07 403.8
Int. Cl. G03d *3/08*
U.S. Cl. 95—89 R **8 Claims**



Apparatus for automatic sensitometric testing of photographic film, characterized by direct sequence of stages, synchronized one with another with respect to the feed rate of a test film strip to be passed therethrough: (a) a sensitometer in which the test film strip is passed in synchronism with a density wedge at constant speed past an exposure slit; (b) a developing and fixing bath with washing and drying sections; and (c) a densitometer, the test film strip being passed at constant speed or at a rate controlled by the densitometer itself past a photoelectric data indicator while a scanner is connected after densitometer. The device permits rapid access to sensitometric data in a few minutes.

3,636,852

MINE VENTILATION CONTROL SYSTEM

James V. Burgess, Jr., P.O. Box 385, Madison, W. Va.

Filed May 11, 1970, Ser. No. 36,339
Int. Cl. E21f *17/00*
U.S. Cl. 98—50 **5 Claims**

This invention relates to a ventilation control system and more particularly and specifically to ventilation control cur-

tain support members. The curtains and support members are used as line brattices, check curtains and temporary stoppings to create a flow path for ventilating air to the working face of the mine. The flow path is such as to direct air down one side of the mine and return the air on the opposite side by traversing the mine at the working face to thereby remove harmful gases and dust therefrom.

3,636,853

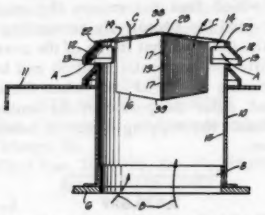
EXHAUST STACK FOR OUTDOOR HEATERS

Chester A. Sable, Orange County, Calif., assignor to Anthony Industries, Inc., Los Angeles, Calif.

Continuation-in-part of application Ser. No. 889,475, Dec. 31, 1969, now abandoned. This application Mar. 6, 1970, Ser. No. 17,112

Int. Cl. F23l 17/02

U.S. Cl. 98—78 7 Claims



Exhaust stack for an outdoor heater including a vent pipe terminating in an upwardly directed open end having annular wind openings in the wall of the vent pipe which are positioned adjacent to its open end. Downwardly directed wind deflectors are positioned outwardly of and extending over the wind openings and spacer elements are positioned within the vent pipe adjacent its open upper end which divide the vent pipe into four substantially pie-shaped quarter sections, the spacer elements extending downwardly in the vent pipe past the wind openings. The upper surfaces of the spacer elements are inclined upwardly toward the center of the vent pipe and a wire mesh screen is positioned in contact with the upper surfaces of the spacer elements to form an upper surface for the vent pipe having a generally conical configuration.

3,636,854

FLUID CONTROL SYSTEM LOUVER UNIT

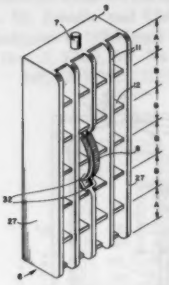
Arthur P. Cary, c/o Cary Products Co. Box A.C., Hutchins, Tex.

Filed Jan. 19, 1970, Ser. No. 3,869

Int. Cl. F24f 13/00

U.S. Cl. 98—110 6 Claims

A louver unit for controlling fluid flow, such as the cool air discharge from an air conditioning unit. The louver is tiltable in one plane and has a plurality of vanes that are tiltable in another plane transverse to the first plane. The louver and vanes are so constructed that the vanes will shut off the airflow and certain vanes will overlay other vanes in close juxtaposition to close any opening that might normally be present in the other vanes.



3,636,855

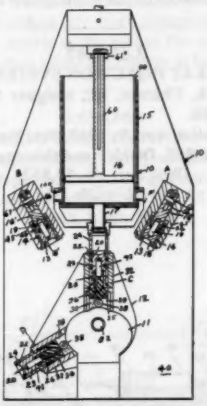
FOOD-COMPACTING AND DISPENSING MACHINE

Anthony R. Serafini, 1118 F. St., Erie, Pa.; Joseph A. Balkovic, 1952 W. 33rd St., Erie, Pa.; Richard E. Waller, 534 Shenley Drive, and Karl A. Wunch, 3615 W. 12th,, Erie, Pa.

Filed Feb. 24, 1970, Ser. No. 14,261

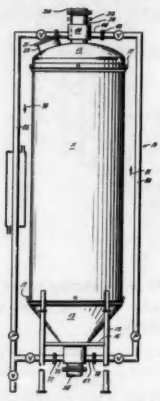
Int. Cl. A47j 43/20

U.S. Cl. 99—234 21 Claims



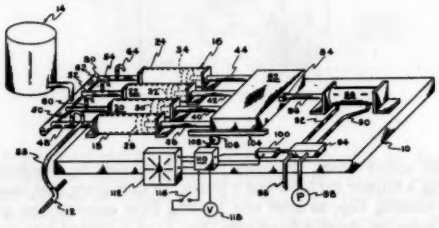
The specification discloses a food-compacting machine having a hopper for food and a piston for delivering said food to a loading cup, at least two loading cups mounted on an axle to move about a fixed cam. The food is loaded into the cups in one position, compacted in a second position and the cup is heated and the food is dispensed from the loading cups in a third position. The loading mechanism has a knife synchronized with the movement of the piston to assist in forming the food, and a cam arrangement is synchronized with the piston drive for controlling the loading, compacting and dispensing in synchronism with each other. The effective volume of the cups can be adjusted.

3,636,856
STEEPING TANK
James H. Neel, 6217 Ariel, Houston, Harris County, Tex.
Filed Apr. 22, 1970, Ser. No. 30,658
Int. Cl. A23b 9/00
U.S. Cl. 99—237 3 Claims



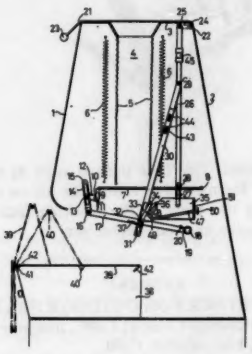
A tank for treating grain including a hollow cylindrically shaped body and an inlet end member and an outlet end member for moving the grain into and out of the body. The inlet and outlet end members include a plurality of nozzles or openings for enabling fluids and air to be circulated through the body while the steeping system is maintained in an isolated state for treatment of the grain inside the tank body.

3,636,857
MEAT INJECTION SYSTEM
Mitchell W. Panek, Chicago, Ill., assignor to Swift & Company, Chicago, Ill.
Original application Apr. 9, 1969, Ser. No. 814,781, now Patent No. 3,556,808. Divided and this application Oct. 5, 1970, Ser. No. 77,862
Int. Cl. A23b 1/16
U.S. Cl. 99—257 3 Claims



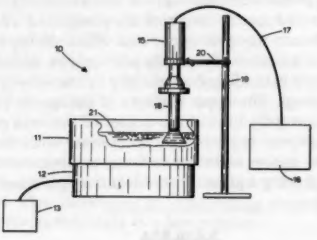
Liquid material for injection at a plurality of sites in a food item is dispensed simultaneously in separate amounts, each amount being a desired proportion of a total quantity of liquid, and delivered for injection at the sites for equal intervals of time.

3,636,858
TOASTER
Julius Barclay Estrup Paaskesen, Naverland 17-19, 2600 Glostrup, Denmark
Filed June 29, 1970, Ser. No. 50,454
Claims priority, application Denmark, July 22, 1969, 3950/69
Int. Cl. A47j 37/08
U.S. Cl. 99—335 9 Claims



A toaster having a vertically orientated toasting compartment with a hinged cover a hinged bottom which during a toasting operation is held in a horizontal position by means of a pawl. The pawl is withdrawn to discharge the toasted bread by means of a tripping device controlled by an adjustable timing device which thus determines the toasting period. Means are provided for operatively connecting the bottom, the cover and the timer so that lifting of the cover causes the bottom to be lifted to horizontal position and locked by the pawl and the timing device to start when the cover is subsequently closed. After the period of the timing device has run out, it actuates the tripping device to release the compartment bottom.

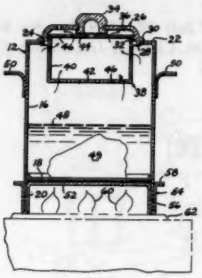
3,636,859
ULTRASONIC COOKING APPARATUS
Lawrence E. Null, Albuquerque, N. Mex., assignor to Energy Conversion Systems, Inc., Albuquerque, N. Mex.
Filed Oct. 20, 1969, Ser. No. 867,571
Int. Cl. A47J 27/00
U.S. Cl. 99—348 5 Claims



An improved apparatus and method for cooking utilizing the application of ultrasonic energy above the audible frequency range and below the microwave frequency range to increase the speed and efficiency of cooking. The apparatus comprises a heat source coupled to a container with liquid cooking medium therein, an ultrasonic power supply and transducer and an acoustic horn for coupling the ultrasonic energy through the liquid cooking medium into the

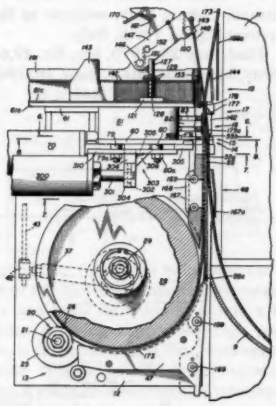
item being cooked. The method comprises the steps of placing the food to be cooked in a liquid cooking medium, heating the cooking medium to cooking temperature for the particular food involved and applying to the cooking medium sound energy in the ultrasonic frequency range.

3,636,860
COOKING UTENSIL AND PROTECTIVE SUPPORT
Virginia L. Green, 2134 Watson, Detroit, Mich.
Filed Feb. 3, 1970, Ser. No. 8,211
Int. Cl. A47j *27/10*
U.S. Cl. 99—410 **4 Claims**



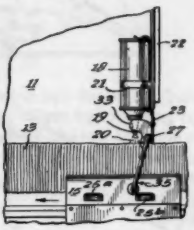
An upwardly open cylindrical container is provided with a bottom wall spaced upwardly from the lowermost edge of its wall. A support, having an annular groove nesting the wall of the lower end portion of the container, shields the bottom thereof. An annular flange, forming the upward limit of the container, centrally supports a foraminated lid and hopper permitting the escape of steam and preventing fluid boilover.

3,636,861
STRAPPING MACHINE
Frank C. Weller, Chicago, Ill., assignor to Interlake Steel Corporation, Chicago, Ill.
Filed Apr. 20, 1970, Ser. No. 30,006
Int. Cl. B65b *13/02*
U.S. Cl. 100—4 **23 Claims**



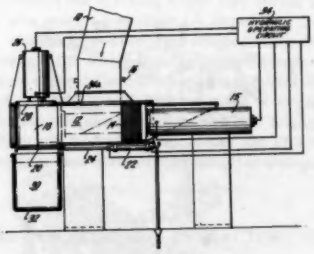
A strapping machine for binding an object by providing plastic strap forming a loop having a supply portion and the leading end thereof overlapping. Tensioning and feeding mechanism, strap-gripping mechanism, strap-severing mechanism, sealing mechanism, strap-gathering mechanism, and seal-feed mechanism are provided.

3,636,862
REFUSE COMPACTOR WITH SPRAY DEVICE
Michael J. Bottas, St. Joseph, and Charles R. Difley, Niles, both of Mich., assignors to Whirlpool Corporation
Filed Nov. 5, 1969, Ser. No. 874,250
Int. Cl. B30b *15/30*
U.S. Cl. 100—45 **16 Claims**



A refuse compactor comprising a cabinet, a refuse receiver such as a drawer having a normally concealed access opening such as the top of the drawer for inserting loose refuse into the receiver and removing compacted refuse therefrom, a compacting ram in the cabinet movable into and out of the receiver to compact refuse therein, movable closure means on the cabinet for selectively exposing and concealing the access opening which in the case of the drawer would be the front panel, means for moving this closure to expose the opening for introduction of refuse into the receiver and to close the opening following the introduction, and means for applying a measured amount of treating agent to the refuse on closing movement of the closure means following the introduction. In the case of the drawer, the drawer would be pulled outwardly for the introduction of refuse, which is usually household refuse, for later compacting and the closing of the drawer activates the means for applying the treating agent to the refuse while the drawer is being closed.

3,636,863
ARRANGEMENT FOR COMPACTING REFUSE
Stanley J. Woyden, Stamford, Conn., assignor to International Petents & Development Corp., Kings Point, N.Y.
Filed Aug. 21, 1969, Ser. No. 852,005
Int. Cl. B30b *15/16*
U.S. Cl. 100—49 **4 Claims**



A control system for use in conjunction with a hydraulically operated refuse compactor. Input signals derived from sensors and limit switches on the compactor are applied to the controlled system which, in turn, generates controlling signals directed to the proper hydraulic valves, and in the correct sequence. Safety interlocks prevent operation of the

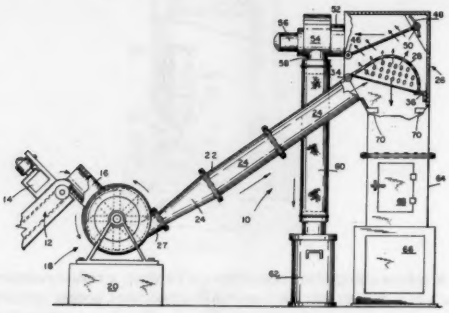
machine when possible damage may be incurred in the machine or by the operator.

3,636,864

SHREDDING AND BALING DEVICE

Alfred Loscialo, Merrick, N.Y., assignor to Gemini Paper Fibers Corporation, Merrick, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,133
Int. Cl. B30b *15/08*
U.S. Cl. 100—91 **10 Claims**



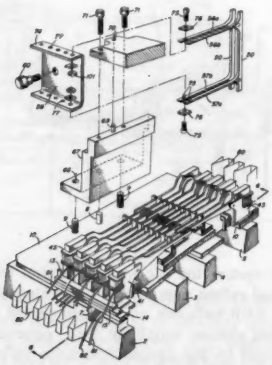
A combination shredding and baling device comprising means for feeding paper, books, magazines and the like into the inlet conduit of a rotary shredding device, the outlet conduit of the shredding device is connected to a housing having vacuum-pumping means connected thereto in fluid flow communication with the outlet conduit, a pair of perforated screen members having elongated openings whose longitudinal axes are disposed substantially perpendicular to one another are positioned within said housing between the outlet conduit and the vacuum-pumping means, the housing includes an integrally formed vertically disposed passageway the upper portion of which is positioned beneath the screen members and the lower portion of which is connected to a baling device and the outlet of the vacuum-pumping means is connected to one end of a porous chute whose other end is secured to a refuse collection container.

3,636,865

PRINT HEAD FOR HIGH-SPEED PRINTERS

Joseph Konkel, Lynnfield, and Frank H. Schaller, Needham Heights, both of Mass., assignors to Data Printer Corp., Boston, Mass.

Filed May 8, 1969, Ser. No. 822,929
Int. Cl. B41j *9/02*
U.S. Cl. 101—93 C **8 Claims**



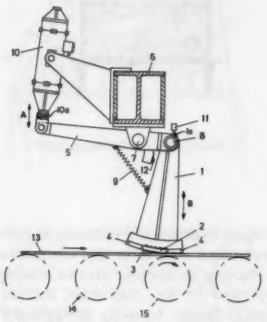
A print head in which a bank of hammers is disposed over a bank of actuators, comprising inner and outer actuator elements of complementary construction. The apparatus is constructed by successively pinning stamped plates to a base frame, one on top of the next. Alignment of the parts is accomplished by a series of dowels so that in general only one positioning step is required to align each part that is secured to the frame.

3,636,866

EMBOSSING PRESS INCLUDING AN ARCUATE OSCILLATING DIEHOLDER

Rolf Stommel, No. 5, Lacherstrasse, 565 Solingen-Widdert, and Hans Bieri, No. 55, Gasstrasse, 565 Solingen, both of Germany

Filed July 18, 1969, Ser. No. 842,994
Int. Cl. B41f *1/00*; B44b *5/00*
U.S. Cl. 101—22 **9 Claims**



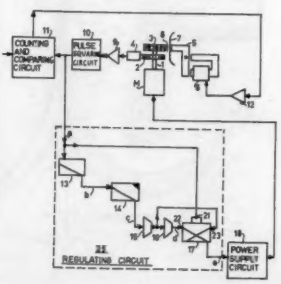
An embossing press for impressing markings and inscriptions into metal sheets traveling through the press on a roller bed, wherein the punch-holder of the press is hingeably attached to one arm of a two-armed lever for deflection in a vertical plane against a restoring force, whereas the other arm of the two-armed lever is operable by an electric actuator for lowering and raising the punch-holder.

3,636,867

PRINT TIMING AND SPEED CONTROL CIRCUIT FOR HIGH-SPEED PRINTERS

Giorgio Bonzano, Caluso, Italy, assignor to Honeywell Information Systems S.p.A., Turin, Italy

Filed June 25, 1970, Ser. No. 49,637
Claims priority, application Italy, June 28, 1969, 18919 A/69
Int. Cl. B41j ; B41f *1/00*
U.S. Cl. 101—93 **10 Claims**



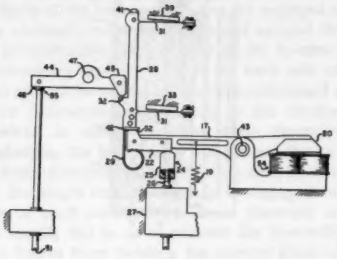
A high-speed "on-the-fly" printer, wherein timing means is provided to identify the position of the print characters on a movable type-carrying member, to denote the instant for actuation of the print operation, and to control the speed of the motor driving the type-carrying member.

3,636,868

ENERGY-DISSIPATIVE IMPROVEMENT IN HIGH-SPEED PRINT HAMMER MECHANISMS

Lynn M. Johnston, West Milton; Chester G. Jones, Kettering; Harold D. Neal, Dayton, all of Ohio, and Samuel A. Redman, Garden City, N. Y., assignors to The National Cash Register Company, Dayton, Ohio

Filed Oct. 6, 1969, Ser. No. 863,826
Int. Cl. B41j 9/24
U.S. Cl. 101—93 C 22 Claims



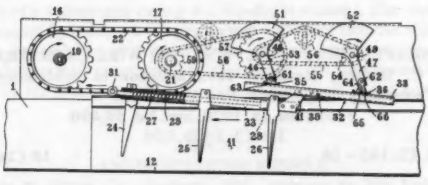
A cooperative plurality of energy-dissipating means is incorporated into a high-speed mechanism so as to be sequentially activated and be operative upon a working member for timely extraction of precise quantities of excess kinetic energy and for producing long life and bounce-free fast operation of the working member. Incorporation of the invention into a high-speed printer wherein energy absorption from components of the printer is accomplished via structurally improved members is also disclosed.

3,636,869

FODDER BALER FEED MECHANISM

Alain F. D'Acremont, Morey St. Denis; Gerard Chaumont, Dijon, and Alain P. Lefeuvre, Perrigny-les-Dijon, all of France, assignors to Sperry Rand France S.A., Puteaux, France

Filed July 10, 1970, Ser. No. 55,300
Int. Cl. B30b 1/00
U.S. Cl. 100—189 7 Claims



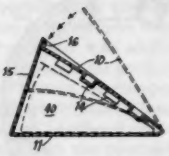
This feed mechanism for fodder baler wherein the relative rates of motion of the moving component elements are of differential nature and same direction to permit a high rate of operation without reaching abnormally high speeds in the guide members, is characterized in that it comprises a device driving the guide member of the finger-supporting bar in order to impress a circular movement of translation thereto, wherein the guide member remains constantly parallel to itself and each one of its points describes a circle by performing a complete revolution at each cycle of the feed mechanism, that is, for each reciprocation of the baling piston, this mechanism being applicable not only to fodder baler but also to any machines designed for treating fiber materials.

3,636,870

DEVICE FOR EXTRACTING FRUIT JUICES

Samuel M. Arthur, 18549 Poplar Ave., Homewood, Ill.

Filed Jan. 26, 1970, Ser. No. 5,808
Int. Cl. A47j 19/02
U.S. Cl. 100—211 3 Claims



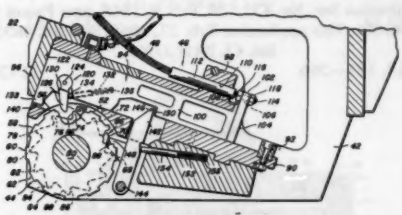
A device for storing and dispensing fruit segments and for extracting juices therefrom by squeezing comprising two disk members dimensioned to have a common edge whereby each of the disk members is movable relative to the other about the common edge, a wall member fixed to one of the disk members opposite the common edge to form a closed wedge-shaped container, and means for releasably latching the disk members to secure a fruit segment there between.

3,636,871

APPARATUS FOR REMOTELY ROTATING A MARKING WHEEL ON A MARKING DEVICE

Edwin W. Speicher, Pittsburgh, Pa., assignor to M. E. Cunningham Company, Ingomar, Pa.

Filed Dec. 24, 1969, Ser. No. 887,809
Int. Cl. B41j 5/04, 7/34
U.S. Cl. 101—95 3 Claims



The characters on the periphery of a rotatable marking wheel are selectively rotated into marking position by a remotely controlled actuating mechanism. The marking wheel has a ratchet portion with a ratchet tooth for each character. The actuating mechanism includes a reciprocating slide with an actuating pawl pivotally connected thereto. For each forward stroke of the slide the actuating pawl engages a tooth and rotates the marking wheel and moves the adjacent character into marking position. A depending finger on the slide also moves into overlying relation with the adjacent tooth to prevent the wheel from rotating through too large an angle to move the adjacent character beyond the marking position. A centering and locking pawl is engaged by the slide on the reverse stroke and moved into engagement with another tooth on the ratchet to center the character in the marking position and maintain the wheel in that position.

3,636,872

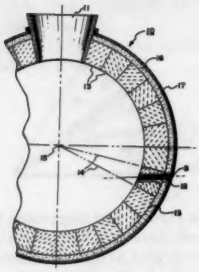
RADIAL INTERLOCKING REFRACTORY TUYERE BLOCK

Roy E. Forcier, Fremont, Calif., assignor to International Minerals & Chemical Corporation

Filed Jan. 29, 1970, Ser. No. 6,667
Int. Cl. F23l 5/00
U.S. Cl. 110—182.5 10 Claims

A two section refractory block for lining a horizontal cylindrical furnace, such as a copper converter, one section con-

taining a nonradial tuyere for said converter. The two sections of the block are held in abutting relationship to form a boundary extending from the inner radial wall of the converter to an outer radial wall. The sections are restrained



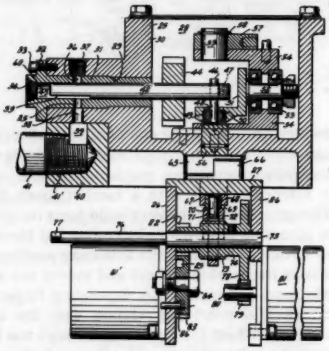
against relative radial movement by providing a depression in the boundary surface of the tuyere containing section and a complementary protuberance in the boundary surface of the other section.

3,636,873

INKING PUMP MECHANISM FOR PRINTING MACHINES

Ralph L. Fusco, Commack, N.Y., assignor to Wood Industries, Inc., Plainfield, N.J.

Continuation-in-part of application Ser. No. 701,631, Jan. 30, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 431,130, Feb. 8, 1965, now Patent No. 3,366,051. This application Feb. 27, 1969, Ser. No. 803,023
Int. Cl. B41f *31/08*
U.S. Cl. 101—366 **11 Claims**



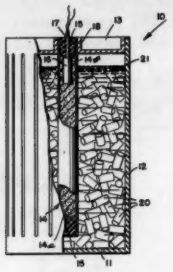
An inking mechanism for supplying ink, by means of a measuring pump, to the ink rail of a printing machine. The pumping mechanism having a piston plunger rotatively and reciprocably carried in a ported cylinder and connected at one end to a crank mechanism for imparting the reciprocal motion. The angle of the crank mechanism and thereby the stroke of the plunger which regulates the amount of ink being supplied, is controlled by an adjusting mechanism which is operated either manually or remotely by means of an indexing motor. The pumping mechanism is driven through shafts and gearing directly from the press drive and may be silenced during nonprinting operations by means of an electrical clutch arrangement.

3,636,874

METHOD AND MEANS FOR DISPERSING CHEMICAL AGENTS

William A. Gey, and Armin T. Wiebke, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Mar. 31, 1965, Ser. No. 444,472
Int. Cl. F42b *13/14, 25/14*
U.S. Cl. 102—6 **3 Claims**



In a device for dispersing liquid agents:

a frangible charge;

a burster charge;

means mounting the burster charge within the casing near the center thereof;

an electrical initiator mounted within said burster charge;

electrical connecting means connected with said initiator and extending from said casing adapted to conduct an electrical current from a given source to said initiator for initiating an activation thereof;

a plurality of open containers randomly disposed within said casing and grouped about said burster charge in a self-supporting group in a manner such that a plurality of voids are established between said containers in communication with the interior thereof;

a preselected liquid agent filling said casing and containers; and

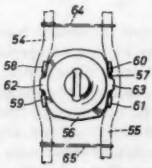
means sealing said casing to provide a sealed liquid agent disseminator.

3,636,875

SHAPED CHARGE DEVICES FOR WIRE CARRIERS

A. C. Dodson, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 29, 1970, Ser. No. 50,490
Int. Cl. F42b *3/08*
U.S. Cl. 102—20 **10 Claims**



The particular embodiments described herein to illustrate the invention include encapsulated shaped charge devices having high-strength ceramic cases which are mounted on a wire carrier for movement into a well bore in which a per-

forating operation is to be conducted. As is typical, the wire carrier is comprised of a pair of paralleled rods or laterally spaced wire members respectively having spaced reversely curved portions and cooperatively arranged in relation to the other wire for defining a series of enlarged openings along the carrier which are respectively adapted for receiving an encapsulated shaped charge. To secure the shaped charges to the wire carrier, a lead band arranged around each charge case is provided with a pair of outstanding lugs respectively projecting outwardly from each side of the case and adapted to engage only a small portion of the rear face of each of the two carrier wires. In one embodiment of the invention, the forward faces of the two carrier wires are engaged against the rear of a circumferential flange formed around the ceramic case. In an alternative embodiment of the invention, one or more outstanding lugs are formed on each side of the lead band and spaced forwardly of the first-mentioned single lugs a distance corresponding generally to the thickness of the carrier wires. In either situation, upon detonation of the shaped charges, the lead bands will protect the carrier wires from laterally directed explosive forces and, by virtue of having only the single outstanding lugs in engagement with the rear face of each carrier wire, these rearward outstanding lugs will readily fail so as to prevent the forwardly directed explosive forces from twisting the carrier wires about their respective longitudinal axes which otherwise frequently causes failure of the wires at one or more points along their lengths.

3,636,876

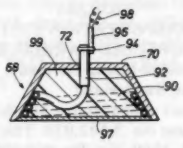
METHOD AND APPARATUS FOR INSTALLING PIPE NIPPLE

Richard V. Evans, Gretna; Virgil Willians, Jr., Mandevilla, and Max A. W. Reiher, Gretna, all of La., assignors to Dick Evans, Inc., Harvey, La.

Original application May 12, 1967, Ser. No. 638,077, now Patent No. 3,492,824. Divided and this application May 8, 1969, Ser. No. 824,387

Int. Cl. F42b *1/00*

U.S. Cl. 102—24 **8 Claims**



Methods and apparatus for installing a pipe nipple in the wall of a submerged casing in a fluidtight manner. The casing is tapped by cutting a hole in its wall sufficient that the nipple can be slidably inserted therein. An explosive charge of predetermined magnitude is detonated in the nipple and opposite the casing wall so as to expand the nipple in the hole.

3,636,877

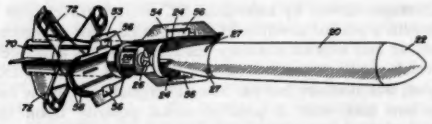
ANTISUBMARINE MISSILE

Alvin R. Eaton, Jr., Norbeck, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 2, 1964, Ser. No. 372,127

Int. Cl. F42b *17/00*

U.S. Cl. 102—49.5 **3 Claims**



1. In an underwater missile that is launched from a conventional missile launcher with a conventional booster and underwater weapon attached thereto, wherein this improvement comprises an adapter for said underwater weapon comprising the combination of:

a clamshell section provided with external fins and having forward attachment means for attachment to said underwater weapon, said external fins providing stability to the weapon during flight;

said clamshell section being formed in two halves, each half of said section being adapted to receive one-half of the tail section of the weapon employed;

an aft section provided with additional external fins and having coupling means for connecting said aft section to said clamshell section, deceleration means and retaining means for said deceleration means, said additional external fins providing additional control and stability to said weapon during both the powered and the deceleration phases of the flight,

said deceleration means comprises a plurality of drag brakes attached to said aft section and kept in a closed position by said retaining means, releasing means for releasing said retaining means and restraining means for limiting the rate and extent of opening of said drag brakes upon the operation of said releasing means;

said clamshell section having separation means for separating the underwater weapon from said adapter after said deceleration means have reduced the velocity of both the adapter and the weapon to a predetermined value, whereby said weapon falls freely into the water in search of a target.

3,636,878

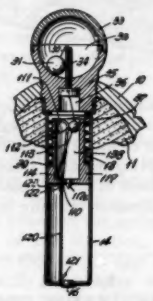
SAFETY GRENADE

James P. Fay, 18 France St., Norwalk, Conn.

Filed Aug. 6, 1969, Ser. No. 847,852

Int. Cl. F42b *27/08*

U.S. Cl. 102—64 **11 Claims**



A grenade having control means for arming the grenade in response to a predetermined free flight thereof and for firing an armed grenade in response to interruption of said free flight of the grenade, said control means having a safety time factor for preventing arming of the grenade in response to short periods of free flight. Means can also be provided for preventing unintentional operation of the grenade.

3,636,879

AIRBURST AND INERTIA IMPACT FUZE ASSEMBLY FOR MUNITIONS

David E. Benner, Webster, Ind., assignor to Avco Corporation, Richmond, Ind.

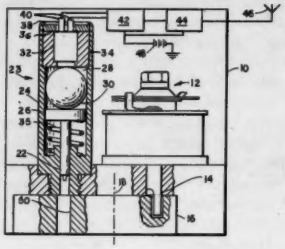
Filed Nov. 6, 1969, Ser. No. 874,526

Int. Cl. F42b *5/08*

U.S. Cl. 102—70.2 R **1 Claim**

A fuze assembly for a bomb is shown. This assembly includes a firing device in which a squib is detonated within a

chamber to drive a firing pin against a detonator charge to detonate a bomb. The squib is exploded by any suitable means such as a proximity sensor to obtain an airburst explo-



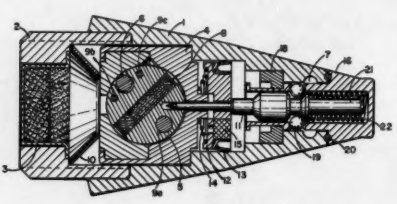
sion of the bomb. An inertia ball, in the same chamber, causes the firing pin to strike the detonator charge upon impact of the bomb on a target, in the event the squib does not perform this function.

3,636,880

CONTROL APPARATUS

Robert L. Aske, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 13, 1968, Ser. No. 783,581
Int. Cl. F42c *15/04, 15/24, 15/26*
U.S. Cl. 102—71 R **4 Claims**



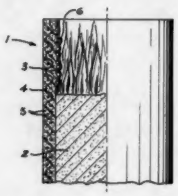
A velocity decay actuated self-destruct mechanism for use with stabilized projectiles. Dynamic pressure against a nose cap due to movement of the projectile through a fluid medium is balanced by spring pressure from within the ogive of the projectile. Movement of the nosepiece as the spring pressure overcomes the dynamic pressure causes self-destruct of the projectile.

3,636,881

GAS-GENERATING CHARGE

John N. Godfrey, Asheville, N.C., assignor to The Susquehanna Corporation

Filed July 25, 1966, Ser. No. 567,512
Int. Cl. F42b *1/00*
U.S. Cl. 102—103 **4 Claims**



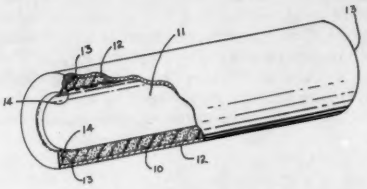
A shaped gas-generating charge comprising a solid, substantially oxidizer self-sufficient, gas-generating grain and a combustion-restricting polymeric inhibitor containing a woven reinforcement and a vaporizable material to cool the polymeric inhibitor and to retard the decomposition of the inhibitor polymer to prevent the introduction of inhibitor decomposition products into the generated gas stream. Vaporizable material is present in the inhibitor in a concentration of from about 10 to about 50 percent by weight based on the total weight of the polymer and vaporizable material in the inhibitor.

3,636,882

DETERRENT COATING FOR PROPELLENT GRAINS

Henry A. Aaronson, Morris Plains; Frank R. Schwartz, Nutley, and Bernard Sukornick, Elizabeth, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed July 14, 1964, Ser. No. 383,270
Int. Cl. F42b *1/00*
U.S. Cl. 102—104 **4 Claims**



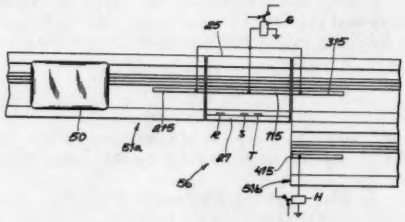
1. A method of preparing progressive-burning, multiple-base propellants comprising tumbling grains of propellant having a perforation through the length of the grain with a powder mixture consisting essentially of about 65 percent copper resinate and about 35 percent lead naphthenate by weight and then applying heat to said grains and powder mixture during tumbling to soften said powder mixture sufficiently to form a continuous, adherent coating on said grains.

3,636,883

AUTOMATIC TRANSPORTATION SYSTEM WITH SELF-PROPELLED CARRIAGES

Erich Wesener, Munich-Laim, Germany, assignor to Buro Patent AG, Glarus, Switzerland

Continuation-in-part of application Ser. No. 626,197, Mar. 27, 1967, now Patent No. 3,502,038. This application Sept. 24, 1969, Ser. No. 860,699
Int. Cl. B61l *11/08*
U.S. Cl. 104—50 **6 Claims**



Carriages driven by individual DC motors travel over a track with a pair of continuous main bus bars for energizing the motor and with an auxiliary bus bar extending along certain track sections where switching operations are to be carried out, this auxiliary bus bar being energizable from the two main bus bars with a predetermined polarity upon the passage of a carriage over such a track section. The carriage is subdivided into a wheeled frame riding on the rails of the

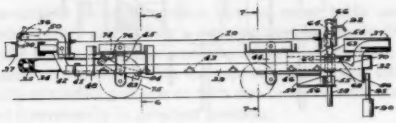
track and a swingable base carrying a traction wheel and contact brushes sliding along the bus bars, this base being spring loaded and weighted to maintain contact between the traction wheel and a cooperating track surface, as well as between the sliding brushes and the bus bars, even when the track is laid on a ceiling with the inverted carriages depending therefrom.

3,636,884

TOW PIN POSITION FOR FLOOR TRUCK TOW LINES

Shelden M. Kavieff, Farmington, Mich., assignor to Jervis B. Webb Company

Filed Jan. 20, 1966, Ser. No. 521,976
Int. Cl. B65g *17/42*
U.S. Cl. 104—172 BT **20 Claims**



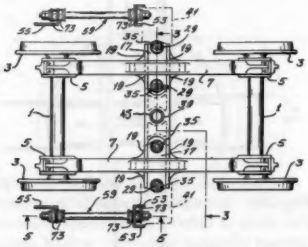
A floor truck having a tow pin driven by a tow line pusher, and fixed front and rear bumpers enabling a driven truck to push a preceding nondriven truck. Interconnected front and rear tow pin positioning bumpers raise the tow pin by rearward and upward movement from a normal forward position when engaging a stop, or the rear positioning bumper of a preceding truck, so a bank of trucks may accumulate. A retaining device prevents return movement of the positioning bumpers and tow pin of any following truck until the tow pin of the leading truck in the bank is engaged by a pusher.

3,636,885

ANCHOR LINK

James B. Cunningham, Northwood, Mo., assignor to General Steel Industries, Inc., Granite City, Ill.

Original application Feb. 2, 1968, Ser. No. 702,576, now Patent No. 3,547,045, dated Dec. 15, 1970. Divided and this application July 30, 1970, Ser. No. 64,899
Int. Cl. B61f *5/08, 5/16*; F16b *35/00*
U.S. Cl. 105—157 A **3 Claims**



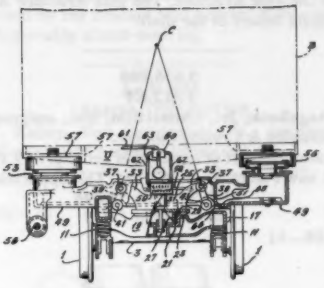
A railway vehicle two-axle truck in which separate longitudinally extending side frames are supported at their ends on the axles, each side frame being formed at its center with transversely extending horizontal web structure wider than the side frame, a transverse transom resiliently connected at its ends to each transverse web structure at points spaced apart transversely of the truck, a transverse bolster pivotally related to the transom at the center of the truck and supported on the side frames by resilient side bearings, upright springs at the ends of the bolster for supporting a vehicle body, and means for transmitting tractive and braking forces from the bolster to the vehicle body. The last named means preferably comprises longitudinally extending improved bolster anchor links each connected at one end to an end of the bolster and at the other end to the vehicle body.

3,636,886

HIGH-SPEED RAILWAY VEHICLE SUSPENSION

Richard L. Lich, Town and Country, Mo., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed June 11, 1970, Ser. No. 45,312
Int. Cl. B60g *21/06*
U.S. Cl. 105—164 **17 Claims**



A suspension is provided for railway passenger cars, to enable such cars to round curves at extremely high speeds without undue discomfort to passengers by providing power means for tilting the car body transversely about a longitudinal axis at a high level, well within the car body, the angle of tilt being responsive to car speed and track curvature. The suspension comprises a yoke mounted on wheel supported truck framing to swivel about a vertical axis and spring support means supported from the yoke by transversely swingable hangers inclined such that their projections intersect at the desired axis of tilt of the car, the body of which is supported on high and widely spaced springs seated on the spring support means and arranged to provide vertical and lateral cushioning independently of the tilting. Transverse movements of the spring support structure on the yoke and consequent tilting of the spring support structure and the car body are effected by transversely acting power means mounted between the yoke and the spring support structure. In a modified form of the invention, the yoke supports separate spring support elements at each of its ends by transversely spaced upwardly converging swing hangers, and transversely acting power means is connected to the yoke and both spring seats to cause the latter to move transversely and tilt correspondingly about the axis of their convergence, thereby causing corresponding tilting of the vehicle body.

3,636,887

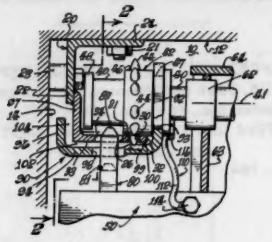
LOAD-DIVIDING GATE SUSPENSION WITH SAFETY MECHANISM

Marion G. Konrad, Hacienda Heights; John W. Erickson, Huntington Beach, and Frank Burnett, Costa Mesa, all of Calif., assignors to Preco, Inc., Los Angeles, Calif.

Filed Aug. 6, 1970, Ser. No. 61,604
Int. Cl. B61d *45/00*; B60p *7/14*
U.S. Cl. 105—376 **2 Claims**

The present safety mechanism comprises a member journaled at each end of the squaring shaft of a gate suspension mechanism, extending generally horizontally below the supporting rail and then extending upward in spaced relation outward of the supporting rail. Such a member retains the defining sprocket in supported relation to the rail despite

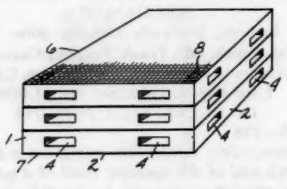
failure of sprocket teeth. The member is preferably journaled directly on the sprocketed roller and coupled by a flexible linkage to the gate structure. The gate structure is then supported despite failure of the shaft.



3,636,888
PALLET
John A. Angelbeck, Jr., Chesterfield, Mo., assignor to Pack-Rite Packaging & Crating Co., Inc.
Continuation-in-part of application Ser. No. 819,130, Apr. 25, 1969, now Patent No. 3,563,184. This application May 4, 1970, Ser. No. 34,096
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **6 Claims**

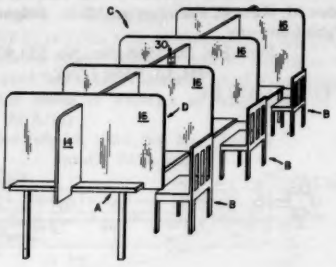
A pallet used for the storage and transporting of containers such as beer kegs and the like. The pallet is formed as a unitary plastic member in a rotational molding operation and includes a pair of spaced outer skins which are internally connected by a plurality of properly spaced webs for internal strength. The skins also have a plurality of strategically located apertures which extend through each of the skins. The pallet has a plurality of downwardly extending shoulders for engagement with containers on its underface and is also provided with supporting areas on its upwardly presented surface for removably supporting a plurality of like containers.

3,636,889
PALLET
Robert T. Mangold, Erie, Pa., assignor to Nosco Plastics, Incorporated, Erie, Pa.
Filed May 19, 1970, Ser. No. 38,773
Int. Cl. B65d *19/18*
U.S. Cl. 108—53 **1 Claim**



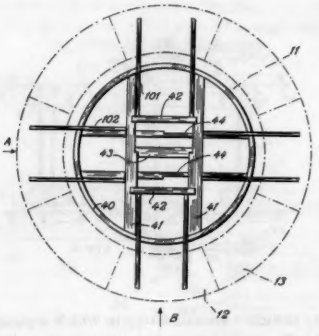
Stacked empty pallets having registering sockets in adjoining surfaces are interlocked by latch members carried by yieldable arms extending from the midsections of the sockets and yieldably projecting from the socket of one pallet into the corresponding socket of an adjoining pallet.

3,636,890
PORTABLE CARREL CONSTRUCTION
Charles A. Huff, 699 Ashton Ave., Palo Alto, Calif.
Filed Sept. 8, 1969, Ser. No. 855,874
Int. Cl. A47b *41/02*
U.S. Cl. 108—60 **4 Claims**



A portable carrel construction consisting of a plurality of longitudinal and transverse crossing opaque barriers is adapted for removable attachment to the upward surface of a table. When a student occupies a chair pulled to the side edge of the table between the crossing barriers, the spatial volume immediate the barriers and above the table is isolated into an individual study space which is insulated from ambient classroom distraction.

3,636,891
TABLE WITH EXTENSIONS
Henry Filso Bertelsen, 6933 Kibaek, Denmark
Filed Sept. 9, 1969, Ser. No. 856,362
Claims priority, application Denmark, Sept. 9, 1968, 4311/68
Int. Cl. A47b *1/00*
U.S. Cl. 108—66 **3 Claims**



The table is made with a solid undivided table top and is provided with leaves which are to be arranged peripherally of the tabletop. The leaves are of the draw-type and are contained under the main tabletop. Slidable bars are disposed under the main tabletop for sliding out to support the leaves. The leaves can be formed so as to fold over on themselves about a hinged joint.

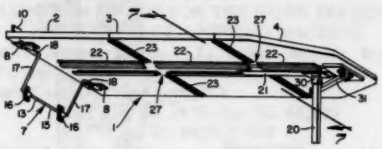
This invention relates to a table having an undivided tabletop with extensions of the draw-table-type.

3,636,892

CONVERTIBLE TABLE

Thomas W. Linton, Bellville, Ohio, assignor to The Snyder Trailer Company, Butler, Ohio

Filed Aug. 8, 1969, Ser. No. 848,438
Int. Cl. A47b *1/04*
U.S. Cl. 108—79 5 Claims



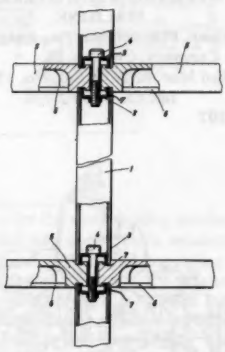
Convertible table comprises two or more table sections hinged together and having a main support leg freely slidable in guide tracks along the underneath side of the table from one table section to another for supporting the table either in the fully extended position or with one or more table sections folded downwardly in dropleaf position.

3,636,893

FREE-STANDING HOUSEHOLD SHELF ARRANGEMENT

Joachim Lange, Karlsruhe-Waldstadt, Germany, assignor to Karl Kubel Gesellschaft mit beschrankter Haftung, Worms, Germany

Filed Mar. 30, 1970, Ser. No. 23,594
Claims priority, application Germany, July 8, 1969, G 69 26 906.3
Int. Cl. A47b *3/00*
U.S. Cl. 108—111 6 Claims



A free-standing household shelf arrangement which includes a plurality of supporting columns arranged vertically and in horizontally spaced relationship to each other each of which comprises hollow individual supports having their ends provided with closure caps while each two adjacent closure caps have interposed therewith shelf means which are connected to the supports by connecting members invisible from the outside.

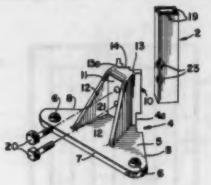
3,636,894

TABLE CONSTRUCTION

Carl H. Hage, Youngstown, Ohio, assignor to The General Fireproofing Company, Youngstown, Ohio

Filed Sept. 18, 1970, Ser. No. 73,513
Int. Cl. A47b *3/06*
U.S. Cl. 108—156 12 Claims

A furniture structure of the type having a horizontal planar surface supported by a plurality of legs which are bounded by skirt sections includes a mounting bracket at each corner defining a vertical channel below the planar surface adapted to mate with two sidewalls of a tubular leg. Mating fastener means carried by the bracket and interior of the leg provide means to removably attach each leg.

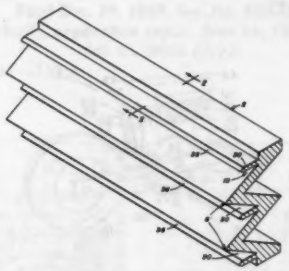


3,636,895

ARMOR STRUCTURE

Ronald A. Kelsey, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sept. 19, 1969, Ser. No. 859,395
Int. Cl. F41I *5/16*
U.S. Cl. 109—78 8 Claims



A substantially rigid armor wall element having an impact surface provided with alternate peaks and valleys. The peaks are generally parallel to each other and taper outwardly in a first transverse direction. The valleys are generally parallel to each other and open in a first transverse direction. Reinforcing means for resisting projectile penetration of the armor element by providing improved resistance at the peaks and valleys. The reinforcing means may be integrally formed or independent elements secured to the wall element. The peaks and valleys preferably include an angle of about 40° to 100°. A wall structure formed from these armor elements by joinder, as by welding, at the abutting marginal edges of complementary configuration.

3,636,896

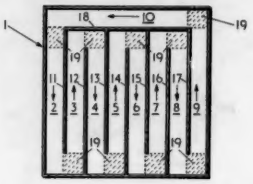
SOLID FUEL COMBUSTION APPARATUS

James McLaren, Gotherington, near Cheltenham, and Walter Harris, Carlton, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed May 12, 1970, Ser. No. 36,647
Claims priority, application Great Britain, May 16, 1969, 25,013/69
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R 19 Claims

Combustion apparatus for burning solid fuel in particulate or divided form includes a plurality of air-permeable floor elements e.g., trays or membranes arranged within a housing. Each element is provided for supporting a fluidized bed of the solid fuel and in one form is inclined to assist the passage of material along the element. In another form of apparatus each element is horizontal and the passage of material along

the tray is effected by the buildup of a hydraulic gradient between the feed end and the discharge end of each element. Gas-operated means are located adjacent the discharge end of one element and to feed end of an adjacent element, and



are provided for transferring solid material from one element to an adjacent element. The elements may be in side-by-side relationship or they may be arranged one above the other, adjacent trays being either oppositely inclined relative to one another or horizontal and mutually parallel.

3,636,897

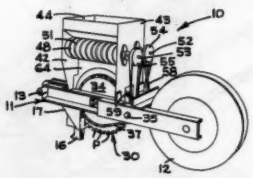
APPARATUS FOR PRECISION PLANTING

Edwin H. Brink, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 6, 1969, Ser. No. 797,061

Int. Cl. A01c *7/16;* **B65h** *5/00*

U.S. Cl. 111—77 **6 Claims**



Seeds confined within cylindrical-shaped capsules are planted by opening a furrow in soil, retaining each side of the furrow in an upstanding position, depositing on the bottom of the furrow a seed capsule standing on its circumferential surface with both end surfaces aligned in vertical planes extending lengthwise of the furrow, and releasing both sides of the furrow to slide inward and engage the end surfaces of the seed capsule. Seed capsules are planted in such a manner by a planter that includes an earth traversing frame, a plow suspended from the frame for opening a furrow in soil, a pair of sidewalls extending rearwardly from the plow for retaining each side of the furrow in an upstanding position and defining a chute therebetween through which a seed capsule can be deposited on the bottom of the furrow, means for inserting seed capsules into said chute at intervals in relationship to ground movement of the planter to provide precise spacing between capsules at the bottom of the furrow, and means for orienting and feeding seed capsules to said capsule inserting means.

3,636,898

EDGE CONTOUR GUIDANCE CONTROL FOR PIECES OF MATERIAL

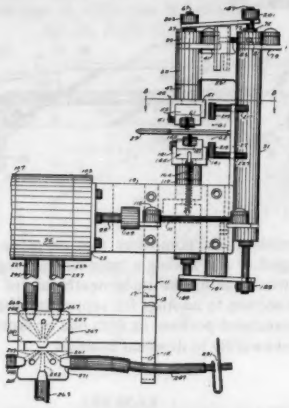
William R. Conner, Jr., Shelbyville, Tenn., assignor to Kellwood Company, St. Louis, Mo.

Filed June 18, 1968, Ser. No. 738,036

Int. Cl. D05b *27/00*

U.S. Cl. 112—203 **25 Claims**

Apparatus for automatically guiding material being fed through a sewing machine to effect contour stitching of the material, whatever its edge contour. The material is automatically shifted laterally to effect contour stitching in response to pneumatic sensing of the position of the edge of the material at any instant relative to the needle of the sewing machine. A first embodiment of the apparatus is for contour seaming of two pieces of material, which may have different edge contours, in which two pneumatic sensors are provided, one for each piece of material, and in which each piece of material is automatically shifted laterally in accordance with its edge contour. A second embodiment of the invention is for overstitching an edge of one piece of material, having a single pneumatic sensor.



3,636,899

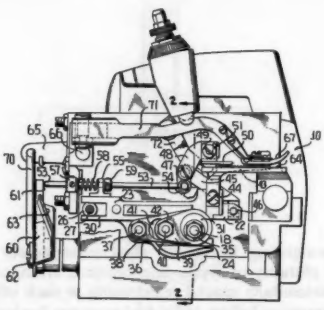
TOP FEED MECHANISM FOR OVEREDGE SEWING MACHINE

Larry Dean Crisler, Philadelphia, Pa., assignor to Union Special Machine Company, Chicago, Ill.

Filed Mar. 6, 1970, Ser. No. 17,088

Int. Cl. D05b *27/06*

U.S. Cl. 112—207 **18 Claims**



This disclosure relates to a top feed mechanism for an overedge sewing machine in which a top feed dog is articulately mounted upon a top feed bar to which feed and lift motions are transmitted by eccentrics. The top feed dog is carried by a pivotally mounted arm which is in turn connected to a slidably mounted rod above and generally in the plane of the top feed bar. Biasing means normally urge the rod in a direction tending to move the feed dog toward its fabric engaging position. Cam means carried by a rotatable plate are provided for moving the rod against the biasing force of the spring to pivot the arm and the feed dog carried thereby to an out-of-the-way position. Lifting motion is im-

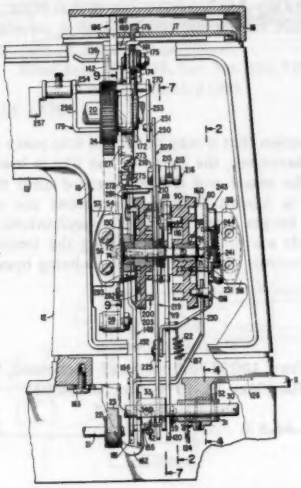
parted to the top feed bar and a main feed bar by eccentrics which are generally 180° out of phase whereby the feed dogs move toward each other to grip fabric therebetween during the feed cycle and move away from each other to release fabric incident to the return cycle of the mechanism.

3,636,900

CONTROL DEVICE FOR THE WORK FEEDING MECHANISM OF A SEWING MACHINE

Frederick Rogers, Union, N.J.; Robert Bradus, Brooklyn, N.Y., and Joseph J. Winar, Roselle, N.J., assignors to The Singer Company, New York, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,329
Int. Cl. D05b *27/00*
U.S. Cl. 112—210 **5 Claims**



A control device for the work feeding mechanism of a sewing machine in which any one of three separate linkages may selectively be coupled to the feed regulating means of the sewing machine. The three linkages, for manual feed control, pattern cam influence of work feed, and automatic group stitching such as buttonholing, while organized in a compact subassembly are distinct and individually tailored each to satisfy its own special requirements.

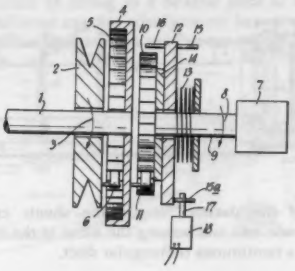
3,636,901

NEEDLE-POSITIONING ATTACHMENT FOR A SEWING MACHINE

Nigel Sturges, Chatham, and Leonard Charles Nutton, Rochester, both of England, assignors to Sewprima Limited, Brompton, Gillingham, Kent, England

Filed Feb. 24, 1970, Ser. No. 13,657
Claims priority, application Great Britain, Oct. 29, 1969, 52,949/69
Int. Cl. D05b *69/22*
U.S. Cl. 112—219 A **3 Claims**

A needle-positioning attachment for a sewing machine having a main drive spindle for reciprocating a needle, including a main drive wheel connected to the main drive spindle for rotation in one sense with overrun, a secondary drive motor continuously driving a secondary drive spindle which, through coupling means, drives the main drive wheel; and a selector device which is operatively at rest whereby the secondary drive spindle rotates within said device and drives



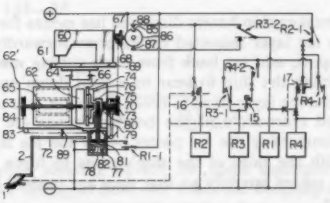
the main drive wheel to a stop position when the drive from the main drive motor ceases.

3,636,902

CONTROL DEVICE FOR THE OPERATION OF A SEWING MACHINE

Toru Matsubara; Tadashi Kozuka; Hiroaki Shinomiya, and Noritoshi Aoyama, all of Tokyo, Japan, assignors to Tokyo Juki Kogyo Kabushiki Kaisha

Filed Dec. 29, 1969, Ser. No. 888,492
Claims priority, application Japan, June 19, 1969, 44/48726
Int. Cl. D05b *69/22*
U.S. Cl. 112—219 A **4 Claims**



A control device for the operation of a sewing machine comprising in combination a sewing machine for carrying out a sewing cycle; an electric driving device for electrical connecting to and disconnecting from said sewing machine; a manual control device having an inoperative position and different operative positions for controlling said driving device so as to drive and stop said sewing machine; and an electric stop device connected to said driving and control devices for selectively stopping a sewing machine needle at a predetermined upper or lower point.

3,636,903

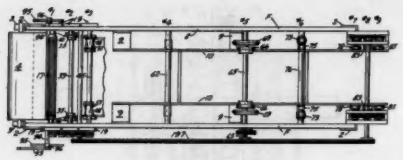
RECTANGULAR-DUCT FORMING MACHINE

Leroy E. Anderson, and Gerald J. Munn, both of Detroit Lakes, Minn., assignors to Snappy, Inc., Detroit Lakes, Minn.

Filed Feb. 19, 1970, Ser. No. 12,663
Int. Cl. B21d *39/02*
U.S. Cl. 113—54 **32 Claims**

A machine designed to continuously progress a pair of elongated flat sheets of metal longitudinally through a plurality of cooperative dies which progressively in sequential steps gradually shape the two sheets into a duct having a rectangular cross-sectional configuration. The machine utilizes cooperative rotary dies to shape and form the duct in a continuous operation to a length equal to that of the sheets so that rectangular ducts of any desired length can be

produced in an automatic operation by merely inserting into the machine a preprepared roll comprised of a pair of sheets



of metal of the desired length, the sheets entering the machine at one end and leaving the same at the other end in the form of a continuous rectangular duct.

3,636,904

ICEBREAKER EQUIPMENT FOR SHIPS

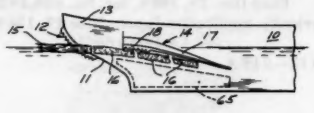
Charles Blanchet, Grenoble, France, assignor to Societe Grenobloise d'Etudes et d'Applications Hydrauliques, (SOGREAH), Grenobles, France

Filed Jan. 14, 1970, Ser. No. 2,893

Claims priority, application France, Jan. 17, 1969, 6900922

Int. Cl. B63b *35/08*

U.S. Cl. 114—41 **7 Claims**



The icebreaker ship herein disclosed has means for cutting a slit in an ice layer mounted on its prow forwardly of the ship's stempost, and set back from such cutting means, are means enabling the ship to bear its weight down on the slit portion of the ice layer so as to break the latter into pieces of ice. Located rearwardly of the bearing means are guiding means for immersing the ice pieces below the ice layer and coacting with the sides of the ship's prow to force the immersed ice pieces laterally so that they are pushed beneath the ice layer.

3,636,905

WINCHING SYSTEM FOR WATERBORNE VESSELS

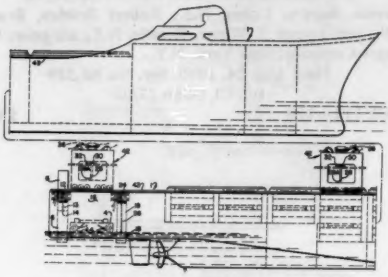
John Hart Wilson, deceased, Late of Wichita Falls, Tex.; Evelyn Wilson Egan; J. N. Sherril, Jr., both of Wichita Falls, and Virginia Wilson Hulver, Houston, executors, all of Tex.

Continuation-in-part of application Ser. No. 677,520, Oct. 24, 1967, now Patent No. 3,552,344, dated Jan. 5, 1971. This application Mar. 31, 1970, Ser. No. 24,178

Int. Cl. B63b *35/44*

U.S. Cl. 114—43.5 **10 Claims**

A winching arrangement for lifting barges and the like from a water area in which a waterborne vessel is located. The present winching arrangement comprises at least two pairs of winches, each pair of which winches utilizes a common line to operate a block and tackle arrangement, with one of the winching mechanisms of each pair of winches being driven by a relatively high-speed motor and the other winch of the winching mechanism being driven at a relatively slow speed by a high-torque motor of greater horsepower. With the winches being connected to opposite ends of the common line of the block and tackle arrangement, with at least one pair of winches lifting one end of a barge or the like and another pair of winches lifting the other end of the barge or the like. The winches and the controls therefor, are so constructed that, as the waves or swells rise and cause the barge to rise faster than the ship or vessel on which the winching arrangement is located, the high-speed winches will take up the slack in the line as the barges are being lifted by the waves or swells and the slow-speed, high-torque motors will lift the barge onto the vessel as the waves or swells recede. The high-speed winching mechanism is held against retrogression by a one-way, releasable brake or the like, and the high-torque, slow-speed motor will continue to wind the winch line onto a winch drum until the barge or the like is at



sufficient elevation that it may be moved into place or placed in storage, whereupon, the barge or the like is lowered into position on the vessel and this is repeated until the waterborne vessel is loaded. Reverse provisions are made for lowering the barges from the winch mechanisms into the water. Controls are provided for sensing the tension of the cable which controls the particular winch being operated.

3,636,906

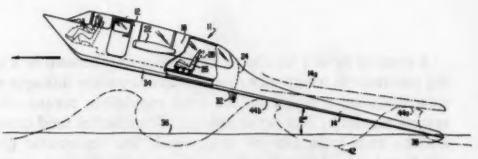
HYDROGLYDER

Carl Frank Wray, 10033 Hull St. Road, Richmond, Va.

Filed May 11, 1970, Ser. No. 36,023

Int. Cl. B63b *1/18*

U.S. Cl. 114—66.5 R **22 Claims**



A rough-water craft having a cabin and a long rigid tail is disclosed. Aerodynamic wings attached to the cabin lift the cabin out of contact with the water's surface but the rear tip of the tail maintains contact with the water's surface and skims therealong. The tailboom is streamlined. Flaps maintain the craft at a 12° attitude when it is in operation. Selectively adjustable cargo carriers hold the cargo level when the craft's attitude is not level.

3,636,907

HYDRACUSHION BOAT

Francis M. Scarritt, Sr., 1338 Park St. North, Saint Petersburg, Fla.

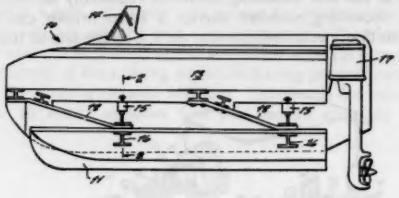
Filed Mar. 16, 1970, Ser. No. 19,824

Int. Cl. B63b *1/18*

U.S. Cl. 114—66.5 R **3 Claims**

A water craft comprising a boat for small travel in rough water, the boat incorporating fiberglas springs for absorbing

the impact of wave action, the fiberglass springs being directly attached at one end to a float and the other end to a



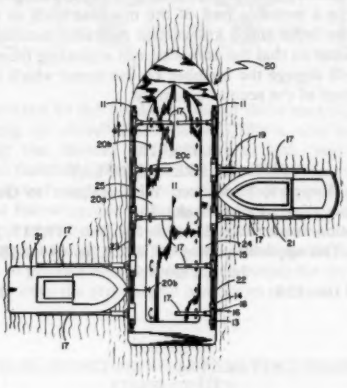
main subhull, and the boat including a special built recoil shock absorber for rebound control.

3,636,908

MOBILE DOCK FOR SMALL CRAFT

Albert Feldman, 4 Upton Road, and Robert Feldman, 7 Larnis Road, both of, Framingham, Mass.

Filed July 29, 1969, Ser. No. 845,759
Int. Cl. B63b *21/00*
U.S. Cl. 114—230 1 Claim



A mobile dock for small craft is described, comprising a ship whose hull has relatively straight and low sides and at least one substantially flat side deck. A track is mounted on the deck to hold movable assemblies. Each assembly has an elongated pole member pivotally movable in a transverse plane. A pair of pole members when extended out horizontally from the deck hold the hull of a small craft.

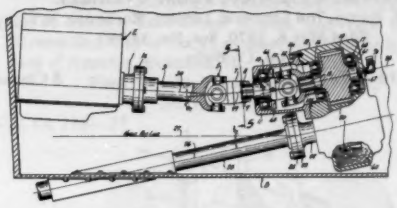
3,636,909

MARINE POWER TRANSMISSION

Carl I. Benson, Jr., Westwood, Mass., assignor to Paragon Gears Incorporated, Taunton, Mass.

Filed Oct. 7, 1970, Ser. No. 78,850
Int. Cl. B63h *23/06*
U.S. Cl. 115—34 R 10 Claims

A power transmission including universal joints for transmitting power between two shafts which are inclined to one another, such as between the shaft of the engine and the propeller shaft which extends at an angle from the engine shaft. The transmission includes a gear housing having an angled housing in which one of the universal joints is rotatably journaled and also includes another universal joint located outside of the angled housing. The universal joint which is located within the angled housing accommodates approximately one-half the angle between the engine shaft centerline and the propeller shaft centerline. The second universal joint located externally of the housing accommodates the remaining angular displacement between the shafts and serves another function of acting as a flexible joint to compensate for small additional angular misalignment between the engine and the propeller shafts which may occur due to manufactur-



ing and installation tolerances, hull deflections, flexible engine mounts, etc.

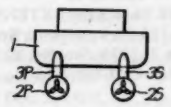
A lubricating means including an impeller driven by the universal joint is located within the angular housing, which impeller forces oil through a conduit and to an antifriction bearing assembly to assure a flow of oil through the assembly and also good circulation in other parts of the transmission.

3,636,910

MARINE STEERING DEVICE FOR SHIPS EQUIPPED WITH TWO PROPELLERS

Teruo Tsuchiya, Tokyo, Japan, assignor to Kabushikikaisha Tokyo Keiki Seizosho (Tokyo Keiki Seizosho Co., Ltd.), Tokyo, Japan

Filed Nov. 13, 1969, Ser. No. 876,340
Claims priority, application Japan, Nov. 22, 1968, 43/85921
Int. Cl. B63h *5/12*
U.S. Cl. 115—35 2 Claims



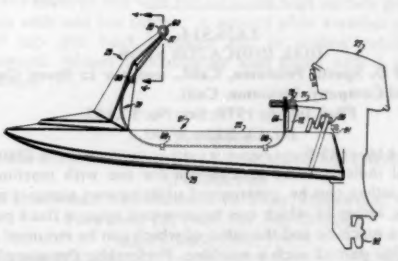
A marine steering device for ships equipped with two propellers having at least one frictional coupling mechanism provided in association with shafts of steering handles for coupling the handles to control the rotation of the two propellers about their vertical shafts to control the ship's heading.

3,636,911

POWER DRIVEN AQUAPLANE

Joe E. Piazza, Pacifica, and Paul E. Nichols, Sunnyvale, both of Calif., assignors to Leisure Products Corporation, Menlo Park, Calif.

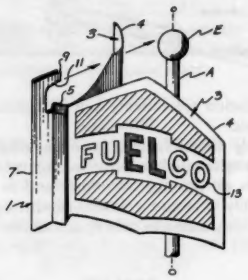
Filed Feb. 16, 1970, Ser. No. 11,574
Int. Cl. B63b *35/00*
U.S. Cl. 115—70 10 Claims



A power driven aquaplane adapted for steering by body motion alone and having a transverse throttle bar mounted

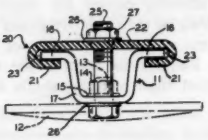
above a foreward portion of the plane or boat which is operable from either end to control the speed of an outboard motor mounted on a stern plate of the vehicle.

3,636,912
DEVICE FOR ATTACHMENT TO AN ELONGATED SUPPORT EXTENDING FROM A VEHICLE
Leonard F. Kamp, 766 Elmwood Terrace, Rochester, N.Y.
Filed May 6, 1970, Ser. No. 34,983
Int. Cl. B60q
U.S. Cl. 116—28 **5 Claims**



A device for attachment to an elongated support extending from a vehicle for indicating the location of the vehicle and for serving as an advertising medium, includes a rigid portion visible from all directions and a variety of types of elements for gripping the external surface of the support to secure the device thereto.

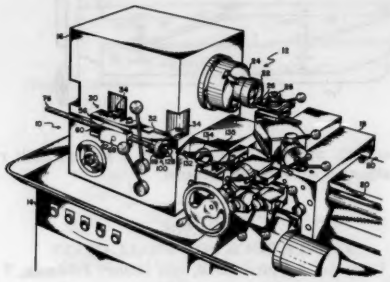
3,636,913
ROADSIDE MARKER EXTENSION
Peter Glavey O'Brien, 166 Parkside Ave., Syracuse, N.Y.
Filed July 2, 1970, Ser. No. 52,012
Int. Cl. G09f *7/18*
U.S. Cl. 116—114 R **1 Claim**



An extension member for roadside marker stakes is formed of an elongated strip of material with flanges bent over at either edge to form longitudinally extending grooves for receiving the transversely projecting flanges of the stakes. The extension member is slid telescopically down over the end of the stake and the extension is secured to the stake by a bolt through holes through the stake and member.

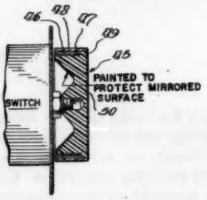
3,636,914
DIAL INDICATOR STOP
Kenneth O. Speed, Petaluma, Calif., assignor to Speed Gage & Tool Company, Petaluma, Calif.
Filed July 6, 1970, Ser. No. 52,185
Int. Cl. B23q *17/00*
U.S. Cl. 116—115.5 **9 Claims**

A dial indicator stop mechanism for use with machines such as lathes can be constructed utilizing two separate assemblies, either of which can be mounted upon a fixed part of such a machine and the other of which can be mounted on a movable part of such a machine. Preferably, the assembly utilized upon the fixed part of the machine such as the headstock of a lathe comprises a rod mounting member through which there projects a measuring rod. The rod mounting member and the rod are provided with coacting detent means enabling the rod to be positioned in various positions relative to the rod mounting member. Preferably an end of the rod mounting member carries a turret which can be rotated so that a selected member on it is in the line of travel



of the second assembly of the complete indicator stop. This second assembly includes an indicator mount adapted to be attached to a movable part of the machine such as the carriage of the lathe and a known dial indicator mounted upon such a mount so that the actuating rod extending from the indicator will engage the member on the turret which is in the line of travel of the second assembly.

3,636,915
ROTARY PRISM DISPLAY
Albert L. Ruppert, Middleton, Wis., assignor to Oak Electro/Netics Corp., Crystal Lake, Ill.
Continuation-in-part of application Ser. No. 747,717, July 25, 1968. This application May 19, 1969, Ser. No. 825,898
Int. Cl. G09f *9/00*
U.S. Cl. 116—124 **6 Claims**

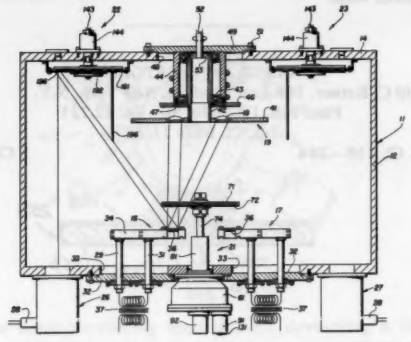


A rotary display device using a transparent circular prism having a conical reflecting surface, an object surface and an image surface. Indicia is positioned adjacent the object surface and is visible at the image surface at least partially by the use of ambient light from the image surface.

3,636,916
COATING APPARATUS AND SYSTEM
Alfred J. Thelen; Nils H. Bergfelt, and Eugene A. Eufusia, all of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.
Filed Mar. 14, 1966, Ser. No. 533,996
Int. Cl. B05c *11/00*
U.S. Cl. 118—8 **5 Claims**

Coating apparatus having a chamber with means mounted in the chamber for carrying a plurality of substrates to be coated. First and second sources are disposed in the chamber and contain coating materials which can be evaporated to

produce vapor streams. Masking means is disposed between the first and second sources and the substrates for controlling the amount of each of the coating materials deposited by the vapor stream upon the substrates. The masking means includes a pair of masks and means for moving the pair of masks in accordance with a preprogrammed function so that a coating is deposited on the substrates which is comprised of a mixture of the coating materials having proportions related to the preprogrammed function. The means for moving the pair of masks includes first and second coaxially aligned



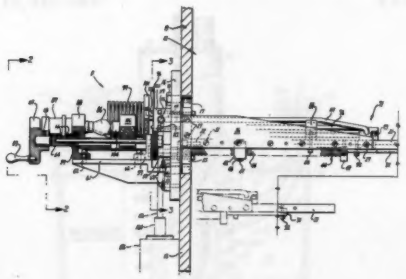
shafts secured to the masks, a pair of drive motors, gearing connecting the drive motors to said shafts, and means for operating the motors in accordance with said preprogrammed function. The means for operating the motors includes control means for one of the motors comprising a reference following said preprogrammed function, means for sensing the position of the shaft of said one drive motor and means for comparing the reference signal with the position of the shaft to provide an error signal and means for driving said one motor until the error signal is reduced to zero.

3,636,917

OPTICAL-MONITORING APPARATUS UTILIZING FIBER OPTICS

Martin L. Baker, Valencia, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed June 29, 1970, Ser. No. 50,844
Int. Cl. B05c *11/00*
U.S. Cl. 118—9 **12 Claims**



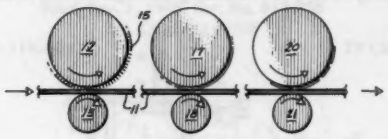
Optical-monitoring apparatus utilizing fiber optics for use with a chamber to monitor material being evaporated from a source having an aperture plate through which vapors being evaporated can be evaporated onto a substrate with fiber optic means for supplying light to the substrate and fiber optic means for receiving light reflected from the material deposited on the substrate.

3,636,918

APPARATUS FOR TREATING A SURFACE OF A DOUBLE-FACED CORRUGATED UNIT

John P. Fischer, East Grand Rapids, and Vern R. Kahler, Grandville, both of Mich., assignors to Packaging Corporation of America, Evanston, Ill.

Filed Nov. 24, 1969, Ser. No. 879,193
Int. Cl. B05c *11/12*
U.S. Cl. 118—37 **2 Claims**



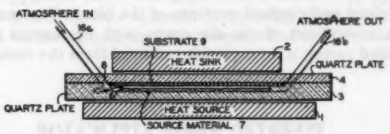
A method and apparatus are provided for treating one surface of a double-faced corrugated unit, such as fiberboard, so as to render the latter more responsive to vacuum pressures when said unit is as a substrate in combination with a heat-softened film during formation of a skin-pack-type package. In utilizing the instant method only one surface of the unit is perforated and then coated with a suitable material whereby the heat-softened film can be readily responsive to the vacuum pressures exerted on the unit and at the same time become securely bonded to the substrate. The perforating and coating steps are accomplished expeditiously during one pass of the unit through the apparatus.

3,636,919

APPARATUS FOR GROWING FILMS

Carl O. Bozler, Columbus, Ohio, assignor to The Ohio State University, Columbus, Ohio

Filed Dec. 2, 1969, Ser. No. 881,512
Int. Cl. C23c *11/00*
U.S. Cl. 118—48 **4 Claims**



Vapor deposition apparatus has a closed chamber formed by a first platelike member having a recess to receive evaporant source material and a shoulder in the top surface thereof to support a substrate closely spaced from said source material and with the substrate back surface generally flush with said top surface. A second plate member overlies said top and back surfaces and in sealing relationship therewith. Means communicate said space with a gaseous medium.

3,636,920

GLUE-DOBBING AND TRAY-FORMING METHOD AND APPARATUS

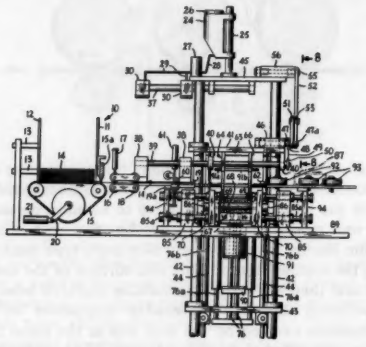
Paul F. Bowman, 500 Northern Parkway, Ridgewood, N.J.

Filed June 12, 1969, Ser. No. 832,782
Int. Cl. B05c *1/02, 11/10*
U.S. Cl. 118—243 **6 Claims**

A glue-dobbing apparatus for applying adhesive in controlled quantities to a paperboard blank and an apparatus for

forming the glued blank into a carton are provided. The glue-dobbing apparatus is comprised of a glue tank which feeds glue intermittently through a solenoid valve to a glue fountain. One surface of the glue fountain is comprised of a resilient sponge which receives the glue from the solenoid valve. A plurality of glue spotters are adapted to contact the surface of the sponge under pressure to uniformly spread the glue within the sponge and conjointly remove a portion of the glue therefrom. The glue spotters are moved into contact with the blank whereby the glue carried by them is deposited on predetermined areas of the blank in controlled quantities.

A tray former mechanism comprised of a mandrel and die cavity for forming the paperboard blank into a carton is also provided. The die cavity is comprised of an opening having a plurality of formers for folding the unglued sides of the blank



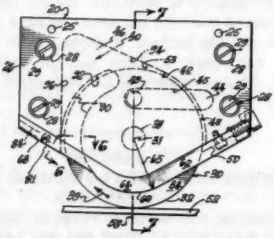
to size. The cavity also has a plurality of plates to bend the glued sides of the blank upwardly which are placed to allow a small clearance opening between the mandrel and glued sides as the mandrel urges the blank into the cavity to prevent the glued sides of the blank from closing on the carton while the mandrel is in its carton-forming stroke. As the mandrel nears the bottom of its stroke, it contacts a moveable bottom plate which pulls the plates downwardly and inwardly on wedge-faced blocks to remove the clearance between the carton and the glued sides. At least 1,000 pounds per square inch of pressure is applied for approximately ¼ second against the glued sides to force them against the carton to urge the adhesive into the surface of the paperboard to cause bonding of the glued and unglued portions of the blank. The mandrel is then moved out of the die cavity with the carton and the finished carton is then quickly removed from the mandrel.

3,636,921

INVERTED WHEEL APPLICATOR

Glynn H. Lockwood, Carmel Valley, Calif., assignor to Lockwood Technical, Inc., Sand City, Calif.

Filed June 24, 1970, Ser. No. 49,343
Int. Cl. B05c *1/08*
U.S. Cl. 118—259 **6 Claims**



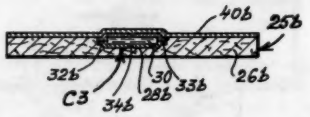
When liquids such as hotmelt adhesives are applied to an upwardly facing surface by an inverted applicator wheel, liquid has tended to drip onto the work from the wheel or from the lower surfaces of the wheel housing. The present structure virtually eliminates such drippings by forming the housing with lower surfaces that incline continuously downward toward a lower termination region closely adjacent a wheel side face, the angle of inclination being sufficient that liquid adheres to the surfaces and flows downward to the termination region, from which it is transferred to the wheel. The housing is relieved where the wheel side faces reenter the housing. Liquid transferred to the wheel then is reliably carried upward and returned to the supply of available liquid in the wheel chamber. Retention of liquid in the wheel chamber is aided by novel shaping of the upper chamber walls.

3,636,922

FLUID APPLICATORS

David C. Ketner, 108 East 82nd St., New York, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,721
Int. Cl. B05c *11/10*
U.S. Cl. 118—264 **5 Claims**



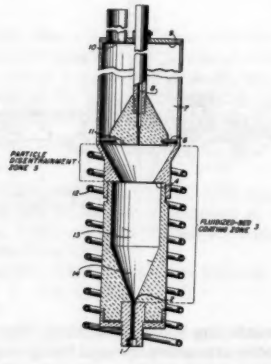
A fluid applicator comprises a sheet, pad, ball or other shaped body made of porous material. Inside the body is one or more sealed nonporous pouch, capsule, bag or other container having one or more compartments enclosing liquid, lotion, cream, paste, salve or other fluid or semifluid substance. The container is frangible and will open under pressure to release the fluid into or through the nonporous material for application to a surface to be treated. One side of the porous body may be covered by a nonporous, moistureproof material to prevent penetration of the fluid through the covered side.

3,636,923

APPARATUS FOR COATING MICROSPHERES WITH PYROLYTIC CARBON

William J. McCreary, and Donald B. Court, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 4, 1970, Ser. No. 16,507
Int. Cl. B01j *9/00*
U.S. Cl. 118—400 **2 Claims**



A fluidized bed coater capable of depositing uniform coatings of high-density, oriented pyrolytic carbon having a

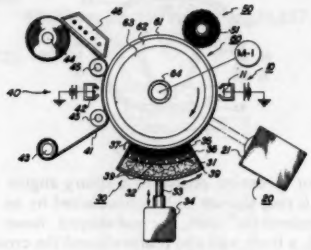
smooth microstructure on a charge of particles having an initial surface area of 44,000 cm.². The deposition is accomplished from an atmosphere containing methane and an inert gas at a temperature of about 1,200° C.

3,636,924

FUR BRUSH DEVELOPING APPARATUS

Ernest A. H. Weiler, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,576
Int. Cl. B05c *5/02;* **G03g** *15/00;* **B05b** *5/02*
U.S. Cl. 118—629 **7 Claims**



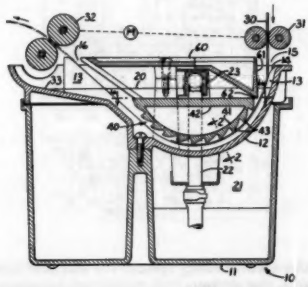
Fur brush developing apparatus for developing a latent electrostatic image on an electrostatic member with toner by simultaneously contacting the member to a toner cloud and toner-laden fur brush including a container to hold toner having a portion of its surface covered by a fur brush, the fur brush and the portion of the container covered thereby having a plurality of apertures, and means to oscillate the container while the fur brush is in contact with the electrostatic member so that toner in the container that is maintained in a mobile, agitated condition passes through the apertures onto and between the fibers of the fur brush and is deposited on the electrostatic member by the fur brush. The fur brush apparatus can be oscillated in an orbital manner so that it gives a multidirectional effect to the developing process producing developed images free of directional marks and background.

3,636,925

INTENSIFICATION ELECTRODE ASSEMBLY FOR DEVELOPER IN OFFICE PHOTOCOPY MACHINE

Henry G. Reuter, Jr., Glenview, and Seno Sparer, Evanston, both of Ill., assignors to American Photocopy Equipment Company, Evanston, Ill.

Filed Aug. 31, 1970, Ser. No. 68,355
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **5 Claims**



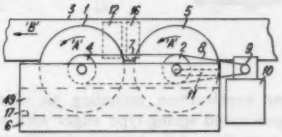
An electrode assembly for use in an office photocopy machine of the type in which a copy sheet carrying a latent image made up of electrostatic charges is guided into a developer tray having a developer liquid in the form of a colloidal suspension of toner particles in a dielectric vehicle. The electrode has a cylindrical face formed into ridges and appearing, in transverse section, to be of sawtooth configuration. The electrode is submerged in the developer liquid closely adjacent the copy sheet. Means are provided for preventing initial contact between the electrode and the leading edge of the copy sheet.

3,636,926

ELECTROGRAPHIC APPARATUS

Robert James Hodges, Cheshunt, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 1, 1969, Ser. No. 812,230
Int. Cl. G03g *13/08*
U.S. Cl. 118—637 **29 Claims**



A combination powdering and scavenging device for electrographic printing and/or display apparatus. Powder is transferred between a powder reservoir and at least one movable recording surface in a manner which provides for a lossless powder system for the apparatus. Powder transfer is accomplished by a readily detachable device comprising a pair of movable surfaces which are spaced apart in the direction of movement of the recording surface and which are parallel thereto. With one surface for powdering and the other for scavenging at least one of the pair is permanently magnetized or charged electrostatically and partially submerged in powder contained in the reservoir.

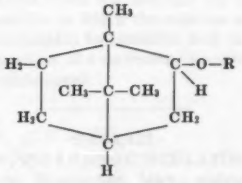
3,636,927

ANIMAL LITTER AND PROCESS

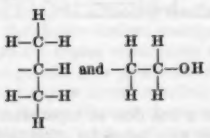
Harold M. Baum, Pepper Pike, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Filed June 18, 1970, Ser. No. 47,600
Int. Cl. A01k *67/00*
U.S. Cl. 119—1 **7 Claims**

Odor-inhibiting litter materials comprising litter containing an odor-inhibiting quantity of a compound of the formula:



where R is selected from the group consisting of



are described. Materials formed in accordance with this invention exhibit odor-inhibiting or odor-masking properties.

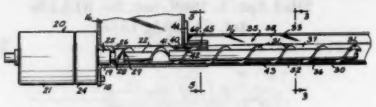
The odor-inhibiting litter materials of this invention are advantageous in that they can be used as animal bedding and the like to mask and/or prevent the formation of undesirable odors in animal laboratories, pet shops, and the like.

3,636,928

AUGER CONSTRUCTION

Elton Sumner, 452 Brookwood Drive, Athens, Ga., and Aaron W. Adams, Jr., Douglas, Ga.

Filed Sept. 17, 1970, Ser. No. 72,971
Int. Cl. A01k *5/00, 39/00*
U.S. Cl. 119—52 **18 Claims**



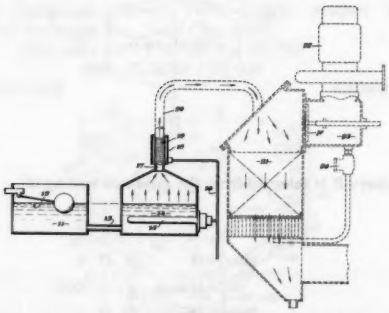
An auger construction including an elongated flexible resilient open-cored spring-type auger with a core member within the open core of the auger and substantially filling this core yet movable with respect to at least a plurality of flights of the auger so that, as the auger flights move with respect to each other while the auger is conveying particulate matter such as poultry feed, the flights and core member will move relative to each other. The core member may be substantially rigid for a straight auger or flexible for a curved auger and may be forcibly moved or held stationary within the auger. The feeder system described includes a feed supply means with means for regulating the amount of feed carried by the auger and return mechanism is provided for returning the excess feed discharged from the auger back to the supply means for recycling this feed.

3,636,929

APPARATUS FOR GENERATING HIGH-TEMPERATURE STEAM

James Richard Sanders, 15 River Gardens, Carshalton, England

Filed Apr. 29, 1970, Ser. No. 32,957
Claims priority, application Great Britain, June 18, 1969 30,812/69
Int. Cl. F22g *3/00*
U.S. Cl. 122—460 **1 Claim**



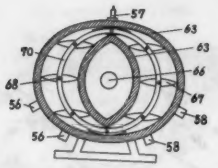
A generator of a free flow of superheated steam in a duct comprises a boiler with means for maintaining constant water level therein and a steam outlet duct leading from the boiler through a superheating chamber having electric or other heating means for superheating the steam passing through the duct in the superheating chamber.

3,636,930

ROTARY ENGINE

Fukumatsu Okada, 4-151 Aza Umemori-zaka, Ohaza Ueda, Tenpaku-cho, Showa-ku, Nagoya, Japan

Filed Feb. 3, 1970, Ser. No. 8,247
Claims priority, application Japan, Mar. 28, 1969, 44/23610
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.45 **6 Claims**



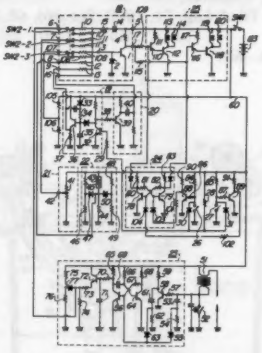
The present invention relates to a rotary engine in which the cylinder is ring shaped and is constructed by an elliptical outer circumferential wall, a leaf-shaped inner circumferential wall, a front wall and rear wall, and the cross section of said cylinder is rectangular and becomes larger at first, smaller next, then larger and smaller at last along the cylinder circumference. Into said ring-shaped cylinder several leaf-shaped pistons are inserted airtightly at equal intervals and the engine has a device to revolve said pistons around the center of said cylinder maintaining their attitudes always in horizontal state. Further the engine has, in the outside of cylinder, the device of connecting the engine output shaft and the piston axes which are fixed to the pistons, whereby the force of explosion gas which acts on the pistons is transmitted smoothly to the output shaft of engine.

3,636,931

FUEL INJECTION CONTROLLING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Seiji Suda, and Masayuki Ishizaki, both of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1969, Ser. No. 815,320
Claims priority, application Japan, Apr. 17, 1968, 43/25206; Sept. 11, 1968, 43/64960
Int. Cl. F02m *51/02*
U.S. Cl. 123—32 EA **12 Claims**



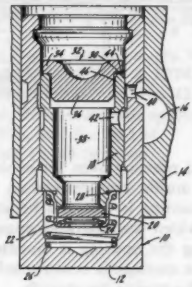
A fuel injection controlling system for internal combustion engines, wherein the various conditions of the internal combustion engine are converted to signal currents, these signal currents are superimposed upon a timing signal current, the

magnitude of which corresponds to a lapse of time, and then supplied to an input terminal of a current level detecting circuit so that there is produced an output pulse signal of which the duration is related to the quantity of fuel required by the internal combustion engine, and a fuel injection valve is opened in accordance with said output pulse signal thereby to control the quantity of fuel supplied to the internal combustion engine.

3,636,932
TAPPET WITH MEANS FOR RELIEVING ENTRAINED AIR

William B. Hamilton, Batavia, and Kenneth W. Lesher, Wheaton, both of Ill., assignors to Stanadyne, Inc., Windsor, Conn.

Filed May 18, 1970, Ser. No. 38,257
Int. Cl. F01l *1/24*
U.S. Cl. 123—90.55 6 Claims

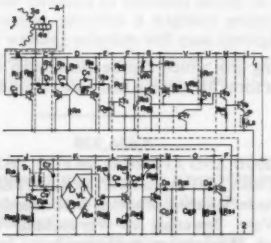


A hydraulic tappet is formed by a barrel having a closed end and a plunger reciprocal within the barrel. The plunger has an oil chamber and a cap is seated on one end of the plunger to close the oil chamber. Passage means are provided at the seat of the cap upon the plunger for the relief of air within the plunger chamber.

3,636,933
ELECTRONIC GOVERNOR FOR INJECTION-TYPE INTERNAL COMBUSTION ENGINES

Yoshio Ohtani; Akihiko Fukushima, both of Higashi, and Todomu Kakijima, Fukuoka, all of Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1970, Ser. No. 40,793
Claims priority, application Japan, May 27, 1969, 44/40630
Int. Cl. B60k *31/00*; F02d *11/10*
U.S. Cl. 123—102 1 Claim

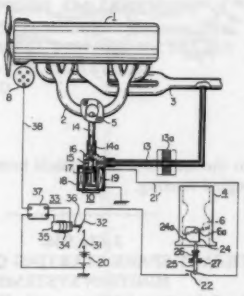


An electronic governor for injection-type internal combustion engines, having a fuel oversupply mechanism for facilitating the starting up of the engine, a speed regulation setting circuit, an electromagnetic fuel control mechanism of movable type and a means for providing an "ungleich" action, in which an output DC voltage proportional to the rotation speed of engine generated by a DC voltage generating circuit and an unbalance output voltage relative to the position of the fuel supply lever of the engine from a bridge circuit are comparated by a voltage comparator circuit, the output of the comparator circuit is fed to an amplifying circuit, and a fuel control rod of the fuel control mechanism is actuated by the output signal from the amplifying circuit.

3,636,934
VEHICULAR AIR-POLLUTION PREVENTIVE SYSTEM

Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Mar. 11, 1970, Ser. No. 18,497
Claims priority, application Japan, Mar. 22, 1969, 44/21282
Int. Cl. F02m *25/06*; B60k *37/00*
U.S. Cl. 123—119 A 6 Claims



A vehicular air-pollution preventive system serious use with an internal combustion engine, which system is adapted to reduce the quantity of nitrogen oxides produced during acceleration or hill-climbing in such quantities as to cause a serious air-pollution problem especially when the vehicle is driven in urban areas, having switches closing when the vehicle is driven under predetermined conditions providing the acceleration or hill-climbing and a solenoid valve which is adapted to pass exhaust gases from the exhaust manifold to the intake manifold when the switches are closed concurrently. The conditions in which the switches are closed concurrently are represented by variables such as the combination of angular position of a carburetor throttle valve and engine speed or vehicle speed.

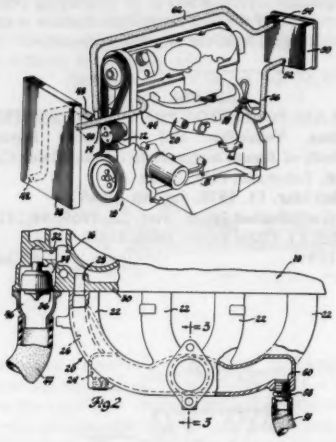
3,636,935
VEHICLE ENGINE LIQUID CIRCULATING SYSTEM

David A. Martens, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 9, 1970, Ser. No. 26,832
Int. Cl. F02m *31/10*; B60h *1/04*
U.S. Cl. 123—122 AB 1 Claim

A vehicle engine includes a cooling system having a main flow path through the engine coolant passages to the vehicle radiator and back to the engine water pump for return to the coolant passages. A parallel flow path exists from the coolant passages through the engine intake manifold for heating the intake mixture and thence through the vehicle heater core and back to the water pump inlet. A thermostatic valve in the main flow path to the radiator controls the coolant temperature by opening or completely shutting off flow to the radia-

tor as necessary. Bypass flow through the manifold and heater core is continuous so that engine coolant heat is



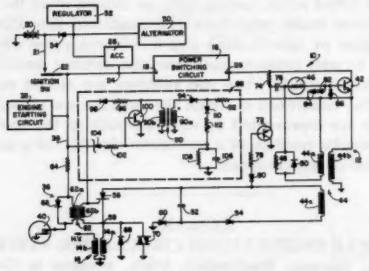
available to the manifold and vehicle heater as soon as possible after engine starting.

3,636,936

AUXILIARY SPARK STARTING CIRCUIT FOR IGNITION SYSTEMS

Gunter G. Schuette, Addison, and William J. Warner, Schaumburg, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 9, 1970, Ser. No. 1,759
Int. Cl. F02p *3/06*; F02n *17/00*
U.S. Cl. 123—148 E **10 Claims**



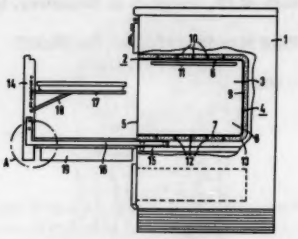
An ignition discharge capacitor is provided for applying pulses to an ignition coil in synchronization with external switching means such as the breaker-points of an automobile. A controlled oscillator is responsive to a reference voltage device which, when a normal voltage value is applied thereto, disables the oscillator. On starting, when the voltage applied thereto is below the normal voltage value, the oscillator will oscillate to produce auxiliary trigger pulses to cause a multitude of spark discharges at the spark plugs of the internal combustion engine in addition to the initial pulse from the ignition capacitor.

3,636,937

BAKING AND ROASTING OVEN

Heinrich Detterbeck, and Heinrich Kaehs, both of Traunrent, Germany, assignors to Siemens-Electrogerate GmbH, Berlin and Munich, Germany

Filed Dec. 9, 1969, Ser. No. 883,457
Claims priority, application Germany, Dec. 11, 1968, P 18 13 866.4
Int. Cl. A21b *1/00*; F24c *15/16*
U.S. Cl. 126—19 R **7 Claims**



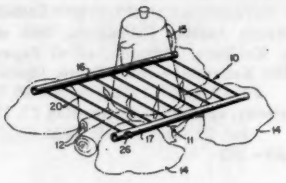
A baking and roasting oven for cooking food and storing utensils has a muffle that defines an enclosure having an opening. A mounting is disposed beneath the muffle and a carriage is provided that movably engages the mounting. A door for closing the opening is mounted to the carriage at fixed angle. The carriage is constructed as a rigid frame and supports a bin for storing the utensils.

3,636,938

PORTABLE COOKING GRILL

Edward J. Faltersack, 19517 Almaden Road, San Jose, Calif.

Filed Nov. 12, 1968, Ser. No. 774,770
Int. Cl. A47j *37/00*; F24b *3/00*; F24c *1/16*
U.S. Cl. 126—30 **5 Claims**



A cooking grill which can be dismantled and reassembled in compact form for storage and ease of handling.

3,636,939

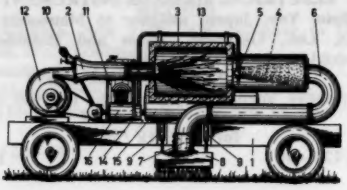
METHOD AND APPARATUS FOR THERMALLY TREATING VEGETATIVE MATERIALS

Pieter Herman Sijbring, Rhenen, Netherlands, assignor to Institute Voor Bewaring en Verwerking Van Landbouwprodukten, Wageningen, Netherlands

Filed Aug. 14, 1969, Ser. No. 850,076
Claims priority, application Netherlands, Aug. 16, 1968, 6811715
Int. Cl. A01m *21/04*
U.S. Cl. 126—271.2 R **8 Claims**

Vegetative materials are thermally treated, before or dur-

ing mowing, by directing a mixture of flue gases and steam



on said materials to sufficiently damage the cell structure thereof causing a substantial loss in turgescence.

3,636,940

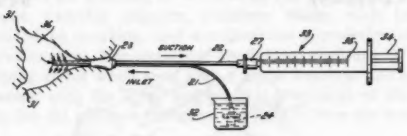
METHOD FOR COLLECTING CELLULAR MATERIAL BY CIRCULATING A FLUID WITHIN A BODY CAVITY

Leland C. Gravlee, 3508 Brookwood Road, Mountain Brook, Ala.

Original application Dec. 7, 1967, Ser. No. 688,723, now Patent No. 3,527,203, dated Sept. 8, 1970, which is a continuation-in-part of application Ser. No. 421,013, Dec. 24, 1964, now abandoned. Divided and this application Mar. 10, 1970, Ser. No. 18,184

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 B 8 Claims



A washing method for irrigating a body cavity using an apparatus having an inlet tube which is open at both ends, and is adapted to have its forward end extend into a body cavity and its rear end connected to a source of washing fluid. Additionally, an outlet tube, which is open at both ends forms part of the apparatus. The inlet tube has its forward end adapted to extend into the body cavity with its rear end connected to a source of suction. A sealing member is positioned on the outlet and inlet tubes intermediate their ends and is adapted to seal the entrance to the body cavity. In operation, the source of suction provides a negative pressure to the body cavity and washing solution will pass through the inlet tube into the body cavity, accumulate cells and matter therefrom and pass through the outlet tube to a collection point.

3,636,941

SPHYGMOMANOMETER ALARM RESET TECHNIQUE

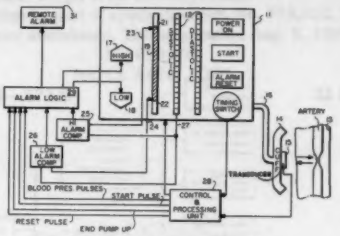
Lawrence Norayr Guevrekian, Kendall Park, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 12, 1970, Ser. No. 2,013

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 A 7 Claims

An alarm reset technique in a sphygmomanometer adapted for automatically monitoring a patient's blood pressure at regular intervals, having electronic detection circuitry responsive to an alarm condition defined by high- and/or low-alarm comparator units and other sphygmomanometer signals to activate an alarm, and electronic logic circuitry for



resetting a prior interval activated alarm without inhibiting subsequent activation of the alarm in the interval when reset.

3,636,942

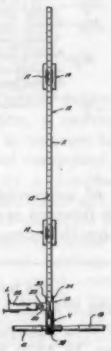
CENTRAL VENOUS PRESSURE MONITOR TUBE SUPPORT ARRANGEMENT

Alice Wade Nye, 7534 Greendowns, Houston, Tex.

Filed Aug. 27, 1969, Ser. No. 853,263

Int. Cl. A61f *5/02*

U.S. Cl. 128—2.05 D 4 Claims



A support arrangement for a central venous pressure monitor tube to maintain the monitor tube in substantial vertical position and its lower end in a predetermined horizontal alignment with a predetermined portion of the torso of an animal. The support arrangement includes bracket means which enables the monitor tube to be adjusted vertically to align it with an animal torso and a level with a cord or chain attached thereto so that the lower end of the pressure tube can be horizontally aligned with a predetermined portion of the torso of an animal.

3,636,943

ULTRASONIC CAUTERIZATION

Lewis Balamuth, New York, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.

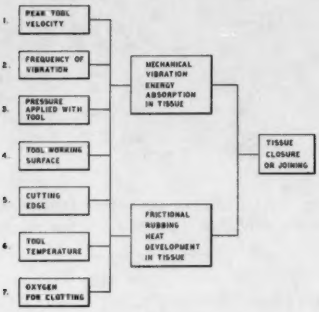
Filed Oct. 27, 1967, Ser. No. 678,649

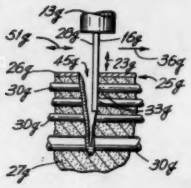
Int. Cl. A61b *17/36, 17/32;* A61h *23/00*

U.S. Cl. 128—24 A 20 Claims

The method and apparatus of the invention use ultrasonic energy in the form of mechanical vibrations transmitted by a tool member to close off small severed blood vessels, such as in humans, by the formation of closures at the terminal portions thereof, and stop what is called "ooze," that requires constant mopping or cleansing techniques during an operation. This tool member may be in the form of a knife ultrasonically vibrated to simultaneously sever and close off

respective terminal portions of the severed blood vessels while performing surgical procedures. The tool member, of a proper configuration, may also join together layers of tissue,


1. PEAK TOOL VELOCITY
2. FREQUENCY OF VIBRATION
3. PRESSURE APPLIED WITH TOOL
4. TOOL WORKING SURFACE
5. CUTTING EDGE
6. TOOL TEMPERATURE
7. OXYGEN FOR CLOTTING
MECHANICAL VIBRATION ENERGY ABSORPTION IN TISSUE
FRICTIONAL RUBBING HEAT DEVELOPMENT IN TISSUE
TISSUE CLOSURE OR JOINING



including the walls of unsevered blood vessels, and with respect to the latter is foreseen as replacing the "tying off" of arteries and veins currently necessary in surgery.

3,636,944

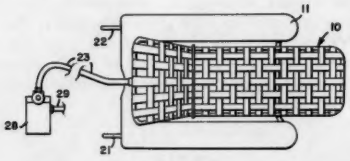
BUOYANT AIR-WATER MASSAGE DEVICE

David L. Bryant, 787 West Sunnyoaks Ave., Campbell, Calif.

Filed Jan. 29, 1970, Ser. No. 6,726

Int. Cl. A61h *29/00*

U.S. Cl. 128—24.1 **7 Claims**



A buoyant chair to be used in a swimming pool provided with plumbing having nozzles for directing air and water jets against the body of the person occupying the chair. The plumbing is connected to the pool water heater and a booster pump is provided in this connection to cause heated water to be circulated through the plumbing and nozzles. One or more air inlets is provided to the plumbing to supply air to be mixed with the water which mixture is released through the nozzles to provide a massaging action on the body of the person reclining in the chair.

3,636,945

ELECTRICAL MASSAGE INSTRUMENT

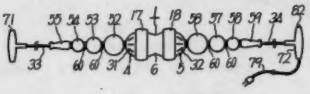
Sanro Sato, Yao, Japan, assignor to Matsushita Electric Works, Ltd., Osaka-hu, Japan and Hoshidenki-Seizo Kabushiki-Kaisha, Osaka-hu, Japan

Filed May 27, 1970, Ser. No. 40,953

Claims priority, application Japan, June 19, 1969, 44/58273; Nov. 1, 1969, 44/103924

Int. Cl. A61h *1/00*

U.S. Cl. 128—36 **17 Claims**



An electrical massage instrument is provided which comprises a main body, 8-shaped in section, having connected at its opposite ends a pair of flexible strings each tying a plurality of spherical members in a row. The main body houses an electrically energized source of vibration such as an electric motor having eccentric weights mounted on the motor shaft. One of the tying strings include lead wires for supplying electric power to the source. The free ends of the tying strings are attached with grip members.

3,636,946

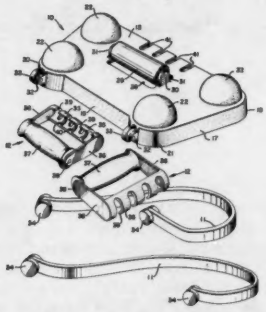
EXERCISING APPARATUS

Peter S. Hardy, c/o Peerless Aluminum Foundry Co., Inc. 55 Andover St., Bridgeport, Conn.

Filed Oct. 30, 1969, Ser. No. 872,693

Int. Cl. A61h *11/00*

U.S. Cl. 128—57 **8 Claims**



An exercising apparatus includes a portable platform base having top and peripheral walls defining a recessed lower side, the top wall having mounted thereon right and left pairs of semispherical resilient members, so spaced that the right and left feet of the user, while in a standing or other suitable posture, are engaged with the respective pairs of semispherical members with one member beneath the arch and heel region of the foot and the other member beneath the toes, thereby providing exercising and massaging treatment for foot ailments, such as flat feet, swollen ankles, and the like. The spacing of the members of each pair of adjustable to accommodate different size feet. A roller is arranged transversely between the pairs of semispherical members for rotational engagement by a foot of the user with a forward and backward reciprocal massaging movement. For the purpose of additionally providing exercise for the arms and other parts of the body, a pair of elastic stretch bands are provided together with a pair of handgrip members, each band having a knoblike means at each of its ends for detachable connection in one of a series of notch formations in each of the handgrip members, enabling a handgrip member to be attached to one or both ends of one or both bands.

3,636,947

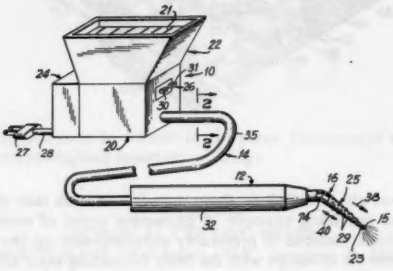
ULTRASONIC HOME DENTAL INSTRUMENT AND METHOD

Lewis Balamuth, New York, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.

Continuation-in-part of application Ser. No. 722,313, Apr. 18, 1968, now Patent No. 3,547,110, dated Dec. 15, 1970. This application Dec. 3, 1970, Ser. No. 94,651

Int. Cl. A61h 9/00

U.S. Cl. 128—66 42 Claims



A method and apparatus for hygienic care of the oral cavity for regular use in the home, in which an ultrasonic applicator is used for cleaning of teeth as by the removal of tartar, placque, calculus deposits, stubborn stains, such as are produced by smoking, and simultaneous stimulation of the gingiva or gums. The ultrasonic applicator or stimulator has a polishing effect when used with a liquid medium and in engagement with the tooth and gingival structures of the oral cavity for the removal of foreign substances from the teeth.

3,636,948

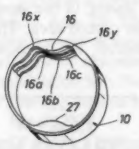
THERAPEUTIC DEVICE

Otto Atchley, P. O. Box 1049, 1901 Richmond Road No. 128, Texarkana, Tex.

Filed May 7, 1970, Ser. No. 35,404

Int. Cl. A61f 5/00

U.S. Cl. 128—79 12 Claims



A male genital device for effecting or enhancing erection of the penis comprising a resilient band suitable for being tightly wrapped around the penis near the pubic bone. The band thus assumes a circular orientation in use, and has a plurality of radially extending projections on the inner surface thereof, said projections being effective to restrict the flow of blood from the penis to thereby achieve the intended result.

3,636,949

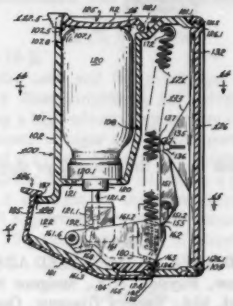
INHALATION-INITIATED AEROSOL DISPENSER

Willis A. Kropp, Warner, N.H., assignor to Armstrong-Kropp Development Corp., West Roxbury, Mass.

Continuation-in-part of application Ser. No. 759,652, Sept. 13, 1968, now abandoned. This application Aug. 8, 1969, Ser. No. 850,694

Int. Cl. A61m 11/00

U.S. Cl. 128—173 R 22 Claims



For dispensing to a respiratory patient single discharges of metered aerosol medication, a conventional aerosol container designed to deliver in response to a single actuation a metered amount of aerosol compound, is combined with a chamber partly formed by a breath-operated membrane linked with a spring-retained catch and latch actuator which on release by the inhalation-deflected membrane presses on the metering valve of the container delivering a single discharge in exactly timed relation with the patient's breathing, and also opens a valve communicating with the outside, to admit free air during the final part of the aerosol discharge for continued inhalation. The actuator linkage and the air valve have to be reset by hand to ready the device for the next cycle of operation.

In an especially compact embodiment, a unitary housing fully encloses the aerosol bottle which is inserted through an opening closed by a retention cover hinged to the housing. A flexible strap serves as a protective cover for the mouthpiece and the air ingress valve, as well as for resetting the mechanism which it locks when covering the valve and the mouthpiece. The actuator linkage has two straight levers at right angles with the catch and latch at their intersection, and the spring tangentially correlated with the breath-responsive membrane.

3,636,950

DISPOSABLE CARTRIDGE FOR ADMIXING TWO COMPONENTS OF INJECTABLE MEDICAMENT

Eloy A. Gomez, Frazer; Stephen W. Goodsir, King of Prussia, and Dominic A. Marrocco, Springfield, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

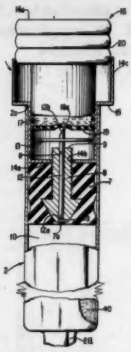
Filed Nov. 14, 1968, Ser. No. 775,726

Int. Cl. A61m 05/00

U.S. Cl. 128—218 M 7 Claims

A cartridge unit for use in, or as a syringe, and comprising two chambers, each for containing a separate component of the final injectable mixture, wherein one of said chambers is detachably mounted on the unit, the other chamber is provided in the unit, and means are provided for communicating said two chambers and then causing the contents of the

removable chamber to be introduced into the other chamber, whereafter the detachable chamber is removed to permit attachment of a push rod to the plunger or stopper when the unit is to be used.



3,636,951

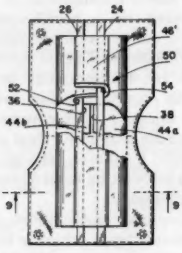
DISPOSABLE DIAPER OF IMPROVED ABSORBENCY

Horace K. Glasgow, Bayside, N.Y., assignor to Frances M. Falbisch, Laurel, Md.; Sandra Glasgow, Queens; Marilyn Pomerantz, Baldwin; Daniel Glasgow, Massapequa and Norman Glasgow, Massapequa, N.Y., part interest to each

Filed Aug. 28, 1969, Ser. No. 853,686

Int. Cl. A61f *13/16*

U.S. Cl. 128—284 **8 Claims**



A disposable diaper of improved absorbency comprising a sheet of absorbent material folded into a multilayered structure in such a manner that a highly improved absorption effect is achieved while at the same time maintaining a garment comfortable to the wearer, and the diaper in combination with a diaper holder specially adapted to receive and hold the same.

3,636,952

DISPOSABLE COMBINATION FLUSHABLE DIAPER AND PROTECTIVE COVER

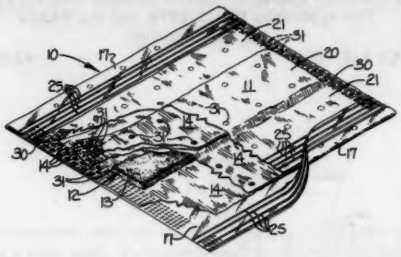
Donald K. George, Aiken, S.C., assignor to Riegel Textile Corporation, Ware Shoals, S.C.

Filed Apr. 24, 1970, Ser. No. 31,610

Int. Cl. A61f *13/16*

U.S. Cl. 128—287 **7 Claims**

A disposable, unitary, combination flushable diaper and protective cover characterized by serving the dual function of a conventional diaper and protective pants and by being easily disposable by stripping off the protective cover and flushing the diaper in an ordinary water closet. The product includes a dispersible, fluid-permeable, body contacting layer for receiving the moisture of the wearer and preferably comprising flat regenerated cellulose fibers of the collapsed multicellular form. A flushable, moisture absorbing, interior pad is superimposed on the body contacting layer for absorbing the moisture of the wearer. The pad comprises a batt of fiberized cellulosic fibers for providing absorbency and at least one ply of cellulosic sheet material on each side of the batt for providing strength. A protective cover of moisture impervious material is preferably superimposed on the pad and forms an envelope with the body contacting layer around the interior pad.



3,636,953

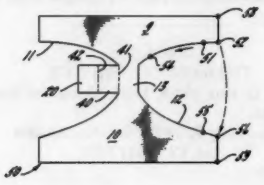
DISPOSABLE PANTY WITH IMPROVED CROTCH CONSTRUCTION

Joseph Benevento, Brooklyn, N.Y., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 21, 1969, Ser. No. 826,347

Int. Cl. A61f *13/16*

U.S. Cl. 128—291 **5 Claims**



A disposable panty has an improved crotch construction in which two auxiliary layers, of the same material as the panty, are disposed over the crotch area. The panty is made from a single sheet of material, all portions cut as a contiguous blank.

3,636,954

COMPOUND LEVER MECHANISM

David Frederick Weston, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 17, 1969, Ser. No. 877,227

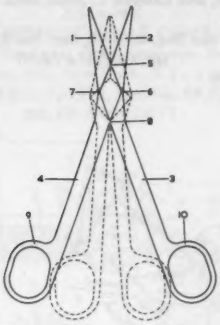
Claims priority, application Great Britain, Nov. 29, 1968, 56,781/68

Int. Cl. A61b *17/28*

U.S. Cl. 128—321 **9 Claims**

A compound lever mechanism of integral construction comprising a pair of opposed compound levers having common fulcra each compound lever comprising two or more simple first order levers articulated in series, the common fulcra and joints between the simple levers being provided by localized zones of the construction adapted to flex preferentially when sufficient force is applied to the levers.

The mechanism is suited for incorporation in a compound lever forceps or like device, thus enabling devices having a



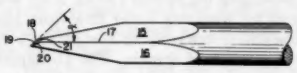
scissors action to be formed in one piece, for example as one-shot polypropylene injection moldings.

3,636,955

SURGICAL CUTTING NEEDLE

Leonard D. Kurtz, Woodmere, N.Y., assignor to Deknatel, Inc.

Filed Dec. 3, 1969, Ser. No. 881,673
Int. Cl. A61b *17/32*
U.S. Cl. 128—305 6 Claims



An improved surgical needle of the type having a simple main cutting edge extending across the needle and formed by the intersection of two planar surfaces, for use in cutting through bone, cartilage or other hard body tissue material. The forward end of the needle includes a third planar surface extending at an angle to the axis of the needle and forming, as its intersection with one of the first two mentioned planar surfaces, a strong rearwardly sloped chisel cutting edge arranged to impinge on the hard material to be cut.

3,636,956

POLYLACTIDE SUTURES

Allan K. Schneider, Wilmington, Del., assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of application Ser. No. 700,036, Jan. 24, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 449,630, Apr. 20, 1965, now abandoned , which is a continuation-in-part of application Ser. No. 308,688, Sept. 13, 1963, now abandoned , which is a continuation-in-part of application Ser. No. 231,860, Oct. 19, 1962, now abandoned. This application May 13, 1970, Ser. No. 36,797
Int. Cl. A61l *17/00*
U.S. Cl. 128—335.5 79 Claims

Absorbable surgical sutures that are dimensionally stable within the body may be prepared by the extrusion of polylactide polymer, including copolymers of L(−) lactide with up to 35 mole percent of glycolide. Said polymers are characterized by an inherent viscosity of at least 1.0, and the extruded filaments are oriented by drawing at a temperature of about 50° to about 140° at a draw ratio of up to 11*x*, and annealed. Sutures so prepared have a tensile strength of from 25,000 p.s.i. to 100,000 p.s.i.

3,636,957

CIGAR SMOKE FILTER AND METHOD FOR IMPROVING THE QUALITY OF CIGAR SMOKE

Charles M. Saffer, Jr., 2 Rockwood Road, Levittown, Pa.

Continuation-in-part of application Ser. No. 728,314, May 10, 1968, now abandoned. This application Mar. 5, 1971, Ser. No. 121,521
Int. Cl. A24b *15/02*
U.S. Cl. 131—10 R 2 Claims

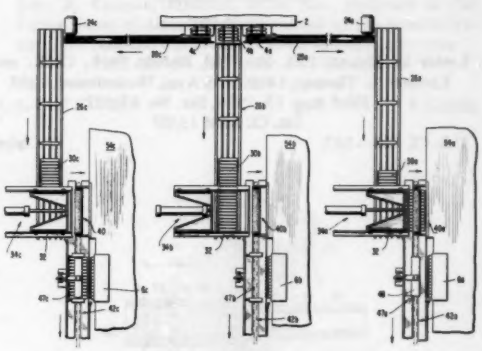
Improving the taste and flavor of cigar smoke which involves using a filter employing an activated carbon filter material having a high-adsorptive capacity for the volatile organic components of cigar smoke and particularly between about 0.04 and 0.17 weight parts per weight part of tobacco of activated carbon filter material having a pore volume of at least about 0.3 $cm.^3/gm.$ in the pore diameter range from about 10 to 40 angstrom units and containing between about 8 percent and 35 percent by weight of adsorbed moisture.

3,636,958

CIGAR HANDLING APPARATUS

Robert C. Sundberg; William Carlson, and Lampkin H. Wood, all of Jacksonville, Fla., assignors to Jno. H. Swisher & Son, Inc., Jacksonville, Fla.

Filed Aug. 3, 1970, Ser. No. 60,543
Int. Cl. A24c *01/38;* A24f *13/24*
U.S. Cl. 131—82 5 Claims



Cigars issuing three abreast from a pressing machine are split into three laterally spaced horizontal conveyors, collected into groups, fed through a head-punching apparatus, and thence fed towards a wrapping machine.

3,636,959

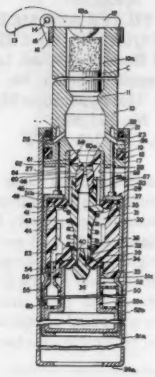
DEVICE FOR INFUSING AN ARTICLE WITH A GASEOUS SUBSTANCE

Jean Marand, Norwalk, Conn., assignor to Geigy Chemical Corporation, Greenburgh, N.Y.

Filed May 25, 1970, Ser. No. 40,052
Int. Cl. A24b *03/12;* A24f *25/00*
U.S. Cl. 131—133 A 9 Claims

A device for infusing an article with a gaseous substance. An article holder having a hollow interior adapted to hold an article to be infused has a cylindrical exterior and a piston

head on one end. A cylinder is slidable on said piston head and has an annular piston thereon in sliding engagement with said cylindrical surface of said article holder to form an expanding chamber between said article holder and said cylinder when said article holder and cylinder are telescoped. The article holder has passages formed therein between the interior of said article holder and said expanding chamber. A



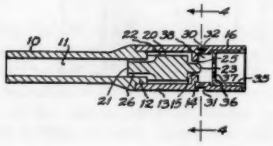
dispensing means for dispensing a gaseous substance with which the article is to be infused is engaged with said article holder and opens into said article holder. The dispensing means is engaged by said cylinder and actuated when said article holder and said cylinder have been moved relative to each other to expand said expandable chamber to produce a vacuum within the interior of said article holder.

3,636,960

SMOKER'S WITHDRAWAL KIT

Lester L. Blount, P.O. Box 748, Balwin Park, Calif., and Leonard L. Thomas, 14092 Ash Ave., Westminster, Calif.

Filed Aug. 13, 1970, Ser. No. 63,401
Int. Cl. A24f *13/00*
U.S. Cl. 131—187 **7 Claims**



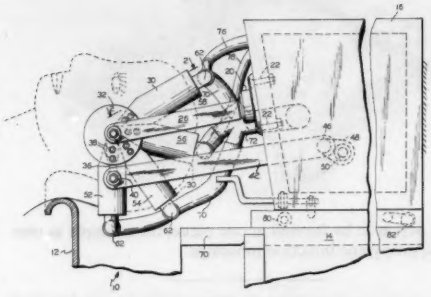
A set of smoking devices such as cigarette holders having air inlet orifices for admitting cooling air into a smoke stream drawn from a front end receptacle through a restricted annular passage against an annular shoulder on the front end of a barrier body disposed within a barrel extending from the receptacle to a mouthpiece stem. After impinging on the barrier shoulder the smoke passes radially outwardly into an elongated annular tar collection chamber, depositing a portion of its entrained tar therein. The orifices of the respective holders are of graduated sizes, whereby by rotating from the use of one holder to another the smoker may undergo successive stages of smoking in which the amount of tar removal is gradually increased so as to successively abate the desire for smoking.

3,636,961

AUTOMATIC SHAMPOO MACHINE

Romeo F. John, and Lennice L. John, both of Route 3, Taylor, Tex.

Filed Dec. 4, 1970, Ser. No. 95,172
Int. Cl. A45d *19/00*
U.S. Cl. 132—9 **5 Claims**



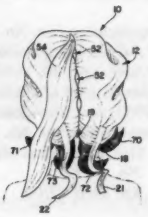
Automatic shampoo machine for use in a beauty shop without necessity of an attendant, characterized in providing a plurality of arcuate or generally U-shaped semicircular elements of increasing size from a lower one to an upper one, having projections of resilient or elastomeric material extensively provided on the inner surfaces thereof for extending inwardly for massaging the patron's head, scalp and hair, and jets or apertures for directing water flow from between said projections essentially inwardly to the patron's head, scalp and hair, when positioned therein. The U-shaped members form liquid applicator and massaging mechanisms which are mounted from an end of a support arm and are provided for being arcuately moved by a pitman and crank arm system mounted from a counter top, the liquid applicator and massaging mechanism being mounted over a shampoo bowl.

3,636,962

WOMAN'S HAT WITH DEPENDING HAIR TRESSES

Angelika Marie Frackowiak, 17 Bendale Blvd., Scarborough, Ontario, Canada

Filed Nov. 10, 1969, Ser. No. 875,343
Int. Cl. A42b *7/00*
U.S. Cl. 132—60 **9 Claims**



A hat intended for concealing a woman's natural hair, for example, in the event that such natural hair is wound on curlers or is otherwise unpresentable, includes a voluminous, crushable and generally opaque covering member held around the wearer's head by a stretchable elastic section extending partially along the peripheral edge of the covering member and a pair of tie strings provided on opposite sides of a cutaway portion in the peripheral edge of the covering member generally opposite the stretchable elastic section. Hairlike tresses are secured, preferably detachably, to the inner surface of the hat inwardly of the peripheral edge

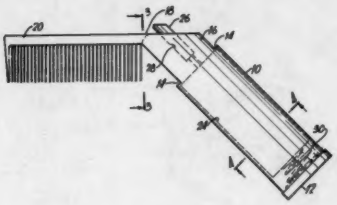
thereof and at several positions therearound so as to extend beyond such peripheral edge.

3,636,963

COSMETIC SPRAY COMB

Elmer B. Olson, Gardena, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 7, 1970, Ser. No. 95,429
Int. Cl. A45d *24/22*
U.S. Cl. 132—112 **5 Claims**



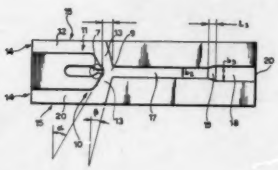
A spray can containing hair treating material is secured to one end of a comb in such manner as to spray said material onto the hair of the user when the comb is in use.

3,636,964

COMPRESSED AIR FEED SYSTEM FOR PURE FLUID DEVICES

Arturo Ferrara Colamussi, and Pier Gabriele Molari, both of Novafeltria, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Nov. 14, 1969, Ser. No. 876,934
Claims priority, application Italy, Nov. 20, 1968, 53972 A/68
Int. Cl. F17d *1/14*
U.S. Cl. 137—13 **4 Claims**



A jet ejector-type device for feeding compressed air to pure fluid devices is supplied by mains air at a pressure of about 6 atmospheres. The mains air passes through a Laval nozzle into a mixing chamber into which open a plurality of inlets from the atmosphere. Atmospheric air is drawn into the mixing chamber, is mixed with the mains air, and the resulting stream passes through an outlet conduit having a portion of enlarged section to feed the pure fluid devices.

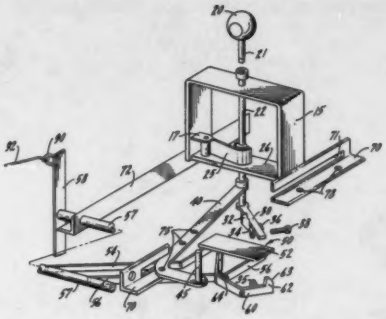
3,636,965

QUICK-CLOSING VALVE MECHANISM

Benjamin John Damiani, Flossmoor, Ill., assignor to Union Tank Car Company

Filed Apr. 15, 1970, Ser. No. 28,885
Int. Cl. F16k *17/38, 31/46*
U.S. Cl. 137—77 **8 Claims**

The invention comprises: a ball valve having an open position permitting fluid flow therethrough and a closed position preventing fluid flow therethrough; a spring to tension the valve towards its closed position; a valve stem attached to the valve; an operating arm, attached to the valve stem, having a first position wherein the valve is in its closed position and a second position wherein the valve is in its open position; a member, having a flange thereon, pivotally attached to the operating arm; a handle movable so as to permit contact with the flange and thereby move the operating arm from its first position to its second position; retention means associated with the handle to retain the operating arm in its second position; and trigger means to pivot the member so as to release the handle from contact with the flange thereby permitting the operating arm to return to its first position.

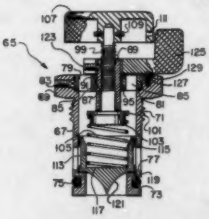


3,636,966

UNDERWATER SPACE SUIT PRESSURE CONTROL REGULATOR

Billy R. Aldrich, Huntsville; Charles R. Cooper, Madison, and John R. Rasquin, Madison, all of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 24, 1969, Ser. No. 869,260
Int. Cl. F16k *17/20*
U.S. Cl. 137—81 **8 Claims**



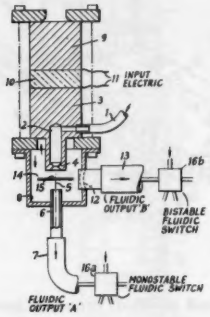
A device for regulating the pneumatic pressure in a ventilated space suit relative to the pressure imposed on the suit when being worn by a person underwater to simulate space environment for testing and experimentation. A box unit located on the chest area of the suit comprises connections for suit air supply and return lines and carries a regulator valve that stabilizes the air pressure differential between the inside and outside of the suit. The valve and thus suit pressure is controlled by the suit occupant and the valve includes a mechanism for quickly dumping the suit pressure in case of emergency. Pressure monitoring and relief devices are also included in the box unit.

3,636,967

CONTROL OF FLUIDIC DEVICES

Norman Moss, Ilford, and Michael John Broad, Enfield, both of England, assignors to The Plessey Company Limited, Ilford, England

Filed June 2, 1970, Ser. No. 42,634
Claims priority, application Great Britain, June 24, 1969, 31,730/69
Int. Cl. F15c 3/12
U.S. Cl. 137—81.5 7 Claims



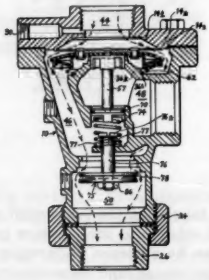
A pressure change suitable for the control of a fluidic switch can be achieved without the use of movable valves by the application of ultrasonic vibrations to a nozzle producing a jet of fluid directed at a coaxial collector orifice. Either collector orifice may be the inlet end of a preferably sharp-edged dynamic-pressure tube, and the pressure in this tube utilized, or the collector tube may be used as a vent of a vessel in which the jet is formed, the change in the pressure in this vessel due to the application of the oscillations, which may be a change from negative to positive relative pressure, being then utilized as a control pressure.

3,636,968

CROSS-CONNECTION CONTROL VALVE

Sebastian David Tine, Lawrence, Mass., assignor to Watts Regulator Company

Filed Oct. 5, 1970, Ser. No. 78,057
Int. Cl. F16k 17/04
U.S. Cl. 137—102 15 Claims



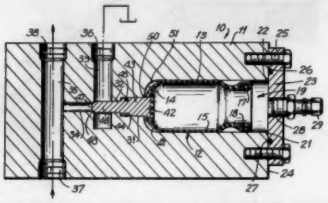
A cross-connection valve provides vertically spaced inlet and outlet valve seats with a balanced relief valve means interposed vertically between the inlet and outlet valve seats and a single abutment for bias means that effects closure of the outlet valve and biases the relief valve means toward a normally open condition. A special flexible construction and arrangement of valve parts and seats permits interconnection of the inlet valve and the relief valve means. The arrangement of parts provides for material reduction in size and cost of construction.

3,636,969

RELIEF AND UNLOADING VALVE

Alphonse A. Jacobellis, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed Feb. 17, 1970, Ser. No. 12,037
Int. Cl. F16k 15/02
U.S. Cl. 137—115 1 Claim



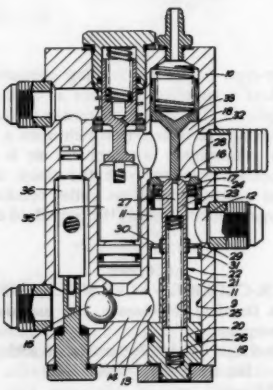
This invention relates to the art of relief and unloading valves which are connected to a hydraulic circuit to relieve excess pressure and more particularly a valve which has a deformable bladder which is precharged with gas under pressure to a value such as to retain a valve member in closed position until the fluid pressure in the circuit exceeds a predetermined amount, overcoming the force exerted by the charged bladder, at which time the valve member will open to relieve the fluid pressure.

3,636,970

FLUID FLOW REGULATOR VALVES

Willard Denis Griffith, and Harry William Norton, both of Ludlow, England, assignors to F. W. McConnel Limited, Ludlow, England

Filed Feb. 17, 1970, Ser. No. 11,957
Claims priority, application Great Britain, Feb. 18, 1969, 8,747/69
Int. Cl. F16k 31/14
U.S. Cl. 137—117 11 Claims



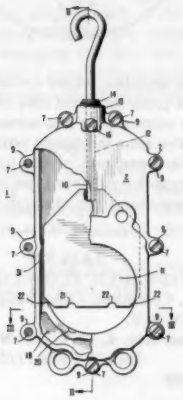
A fluid flow regulator valve comprises a valve chamber having an inlet communicating with fluid under pressure, a service port communicating with a device operated by fluid pressure, and an outlet communicating with exhaust. In the chamber there is a movable valve member having a spring

urging it to close the outlet. A flow-responsive element on the valve member causes a force, dependent on the rate of fluid flow through the chamber to act on the valve member in such a manner as to overcome the spring and move the valve member away from the outlet port when the rate of fluid flow reaches a certain value. The valve member and outlet port are so dimensioned that the pressure of fluid within the valve chamber assists the spring, so that the rate of fluid flow at which the outlet port is opened increases with increase of fluid pressure in the chamber.

3,636,971
GATE VALVE

Donald K. Hagar, Macungie, Pa., assignor to Mosser Industries, Incorporated

Filed Sept. 25, 1970, Ser. No. 75,498
Int. Cl. F16k *3/34*
U.S. Cl. 137—238 **10 Claims**



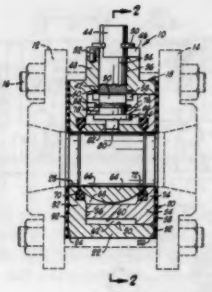
A gate valve with a self-flushing function for use in a pipeline in which solid material or particles are dispersed or entrained in a fluid is disclosed. The valve is composed of a housing having inlet and outlet ports defining an opening and a slidable gate adapted to move vertically in a channel in the interior wall of the housing so as to open or block the opening. A depression is provided in the top edge of each of the opposite walls of the channel, and the bottom edge of the gate contains recesses in correspondence with the depressions. As the slidable gate is lowered, the recesses and depressions will correspond to form an opening on the inlet side and an opening on the outlet side of the gate as the gate otherwise blocks the opening defined by the inlet and outlet ports. The fluid in the pipeline enters the opening formed in the inlet side, flows under the bottom edge of the gate and exits the opening formed in the outlet side and during the traverse under the gate flushes away any solid material clogging the channel below the level of the opening.

3,636,972
JACKETED VALVE

Domer Scaramucci, 3245 South Hattie, Oklahoma City, Okla.

Filed May 7, 1970, Ser. No. 35,353
Int. Cl. F16k *49/00*
U.S. Cl. 137—340 **19 Claims**

A valve for use in a service requiring the valve to be heated or cooled, wherein the chamber for circulation of the heat transfer medium is formed between the outer periphery of the valve body and the inner periphery of a surrounding operating housing. The operating housing carries the valve operator and a valve stem. The valve body is insertable lengthwise into the operating housing and a valve stem carried by the valve body and connected to the valve member is adapted to be connected to the operating housing valve stem

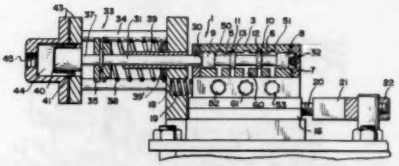


when the valve body is inserted into the operating housing. The valve is adapted for use between mating pipe flanges. Various types of rotary valves and valve body and operating housing configurations are disclosed.

3,636,973
ANALOG POSITION CONTROLLER

Eugene A. Roeske, 440 Three Mile Road, Racine, Wis.

Filed June 1, 1970, Ser. No. 41,896
Int. Cl. G05d *16/06*
U.S. Cl. 137—488 **12 Claims**



An analog position controller for varying the operative position of a control device such as a valve in response to a pressure signal proportional to a variable parameter being controlled by the control device. The analog position controller includes a control valve assembly slidably mounted to respond to the variable parameter wherein movement of the valve transmits a pressure signal to a pressure-sensitive power means to change the position of the control device. The power means is continuously controlled until a null level is reached by the valve assembly at which time the changing of the operative position of the control device is stopped.

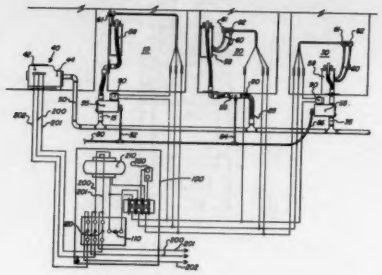
3,636,974
EVACUATOR SYSTEM WITH SHUTOFF VALVE

Luis Beguiristain, St. Paul, Minn., assignor to The Torit Corporation, St. Paul, Minn.

Filed Mar. 4, 1970, Ser. No. 16,381
Int. Cl. A61c *17/04*; F16k *31/02*
U.S. Cl. 137—565 **13 Claims**

An improved evacuation system with shutoff valve in which a plurality of stations having evacuator units therein may be operated from a single vacuum source, such as a motor-driven vacuum pump. The individual stations are connected from a main flow line of the vacuum pump through branch lines which include an improved shutoff valve which is piloted and electrically controlled by hanger switches at the individual stations. The improved circuit includes an ar-

rangement by means of which operation of any of the hanger switches will energize and operate the respective valve and



also energize the operation of the vacuum pump simultaneously therewith.

3,636,975

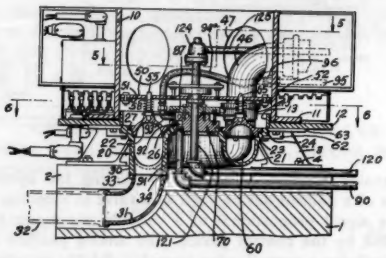
UTILITY ARRANGEMENT AND CONSTRUCTION FOR REVOLVING STRUCTURES

Russell D. Kirkman, 857 Ruland St., San Francisco, Calif.; Chester A. Kirkman, 128 Romley Drive S., San Francisco, Calif., and Wesson A. Kirkman, 9 Linnell Ave., Napa, Calif.

Filed Feb. 2, 1970, Ser. No. 7,554

Int. Cl. F16l *27/08*

U.S. Cl. 137—580 **9 Claims**



A revolving structure having toilets, wash basins, sinks, tubs, and other utilities mounted therein so that the utilities rotate with the structure. The revolving structure is mounted on a base or turntable which is centrally provided with a hub casing, and an annular waste gland has a chamber member and a cover plate axially positioned relative to the annular hub casing. The chamber member is fixed against rotation and is mounted on a fixed foundation member while the cover member is rotated by the hub casing as the revolving structure rotates. Waste material from the utilities is directed through the cover plate into the chamber member in such a manner that the waste material is directed to a waste outlet leading to the sewage system as the structure rotates. A water gland is positioned centrally of the waste gland and supported by the waste gland. The water gland is annular and provided with a nonrotatable outwardly facing annular chamber which is closed by a ring which is revolved as the structure revolves. The ring forming with the annular chamber a water manifold, with suitable piping communicating with the manifold for delivering water to the utilities in the revolving structure.

3,636,976

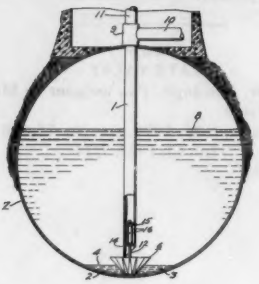
SUCTION VORTEX ELIMINATOR

William B. Hansel, Media, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Apr. 2, 1970, Ser. No. 25,107

Int. Cl. E03b *11/00;* **E21f** *17/16;* **B67d** *5/60*

U.S. Cl. 137—590 **3 Claims**



A bowl-shaped member, whose cross-sectional area is large compared to the cross-sectional area of the pipe, is mounted below the pump suction pipe in a subterranean liquid storage tank. This member rests in upright position on the bottom of the tank, with its open end at the top. The member is so designed that it can be collapsed for insertion into the tank, and for withdrawal therefrom, through the suction pipe.

3,636,977

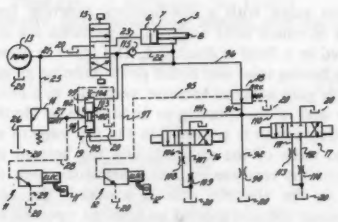
ELECTROHYDRAULIC FLOW CONTROL CIRCUIT

Cecil E. Adams, Columbus, Ohio, assignor to Abex Corporation, New York, N.Y.

Filed Mar. 4, 1970, Ser. No. 16,363

Int. Cl. F16k *11/20*

U.S. Cl. 137—608 **4 Claims**



An electronically programmable pressure and flow control hydraulic circuit. The circuit comprises a pair of electronically programmable pressure control valves, one of which is cooperable with a pressure reducing valve and one or more orifices to control flow through the circuit and the other of which controls pressure in the circuit. When the circuit is used in combination with a hydraulic ram or motor, it enables both the force and speed of the ram or motor to be electronically controlled and programmed.

3,636,978

HYDRAULIC PRESSURE FEEDBACK CONTROL VALVE

James R. Byers, 3620 Mountain Drive, Brookfield, Wis.

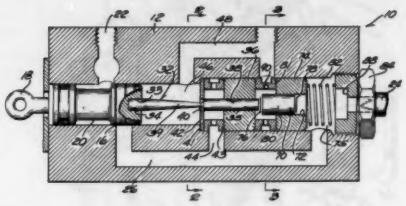
Filed Aug. 24, 1970, Ser. No. 66,318

Int. Cl. F16k *11/07*

U.S. Cl. 137—625.26 **9 Claims**

Disclosed herein is a hydraulic valve with a valve plunger, a metering valve and feedback piston in tandem. A metering valve member has one end fixed to the end of the plunger

and a free end supported in a sleeve to guide a valve portion having a variable cross section through a metering orifice to exhaust fluid into a vent passage and vary the pressure at the valve outlet as the valve plunger is moved. Interchangeable metering valve assemblies containing valve members and orifices with different configurations and dimensions afford different metering characteristics, and thus, different output pressure ranges for different valve applications. The feedback piston is freely reciprocal axially of the plunger and has a feedback face exposed to the valve output chamber and another piston face engaging the free end of the metering valve member to provide a counterforce on the plunger and a "feel" of the output pressure to the valve operator.

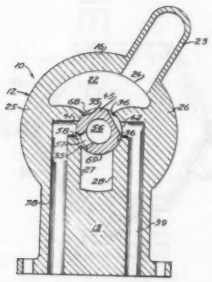


3,636,979

HYDRAULIC VALVE

Shig K. Kamachi, and Roy Lancaster, both of New Westminster, B.C., Canada, assignors to Queensboro Marine Equipment Ltd., New Westminster, British Columbia, Canada

Filed Nov. 24, 1969, Ser. No. 879,465
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.23 **3 Claims**



A valve for controlling flow of hydraulic fluid between a positive displacement pump and a reversible motor. A pair of relatively movable members, having mating surfaces in sliding sealed contact and having ports defining ends of fluid passages, movable into and out of registry, each relatively movable number provided with leads tapering away from the ports in a direction of relative movement of the surfaces, so metering fluid flow through the passages.

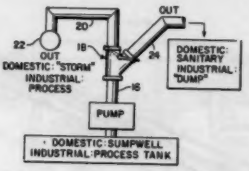
3,636,980

DIVERTER VALVE

Gerald P. Maloney, 44 West Central Ave., Roselle, Ill.

Filed Oct. 16, 1969, Ser. No. 866,961
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.44 **1 Claim**

Fluid pump-effluent is completely and instantaneously routed to one of two conduits in a system which includes a vertically extending main line, passing through a special valve, and a secondary line passing laterally from said valve. The valve includes a closure member pivotable around a pivot line through an arch which is upstream with respect to



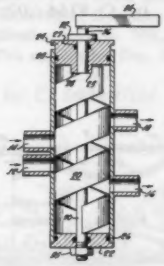
said pivot line, and generally below said pivot line, the pivot line being positioned at one side of said main steam above the secondary line, the closure member being seatable on both primary line, and secondary line, valve seats.

3,636,981

FLOW VALVE

Frederick D. Henry, 18413 Florwood Ave., Torrance, Calif.

Filed May 4, 1970, Ser. No. 34,328
Int. Cl. F16k *11/06*
U.S. Cl. 137—625.46 **18 Claims**



A tubular valve housing is ported to provide for fluid flow to and from the interior of the housing. A helical valve spool having coils of rectangular cross section is rotatably mounted within the housing and has the width of the coils thereof equal to or greater than the ports in the housing whereby various ones of the housing ports are opened or closed by the helical spool coils in various rotational positions of the spool. Temperature compensation and wear compensation are provided by an adjustable tie rod that extends axially through the helical spool to provide a predetermined amount of axial compression which may be adjustable as the spool and housing wear.

3,636,982

INTERNAL FINNED TUBE AND METHOD OF FORMING SAME

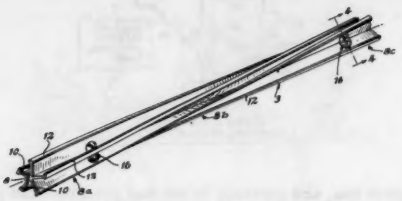
Charles E. Drake, Stroudsburg, Pa., assignor to The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.

Filed Feb. 16, 1970, Ser. No. 11,623
Int. Cl. F28f *13/12*
U.S. Cl. 138—38 **4 Claims**

A tube-type heat exchanger wherein a fin member, including a central core portion and a plurality of fins extending radially therefrom, is located within a tube such that the fins have a close interference fit with the inner wall of the tube. The core portion is composed of a plurality of axially spaced segments, and the fins bridge a space between and interconnect adjacent segments. The space between adjacent segments establishes communication across the core portion

between flow paths bounded radially of the core portion by the tubular member and fins.

The core portion is segmented subsequent to extrusion forming of the fin member by directing a cutting member into engagement with the core portion along a line extending transversely of the fin member.

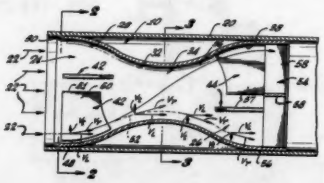


3,636,983

METHOD AND APPARATUS FOR INCREASING FLUID FLOW

Edwin J. Keyser, 14513 Mulholland Drive, Los Angeles, Calif.

Filed Aug. 14, 1970, Ser. No. 63,691
Int. Cl. F15d 1/02
U.S. Cl. 138—39 **16 Claims**



A method and fluid flow device for increasing the rate of flow of a fluid by inducing angular velocities in the flow entering the device thereby to reduce the upstream static pressure, and carrying the angular velocities through the device where it is nullified before leaving the device, thereby to increase the downstream static pressure. Reducing the static pressure of the fluid entering the device and increasing the static pressure of the fluid leaving the device results in two forces of acceleration tending to increase the rate of flow through the device. In one embodiment, the device is a venturi-type nozzle having a forward set of baffles in the converging section and a rear set of baffles in the diverging section, and in another embodiment, the device is a teardrop-shaped flow restriction in a conduit and has a forward set of corrugated baffles and a rear set of corrugated baffles.

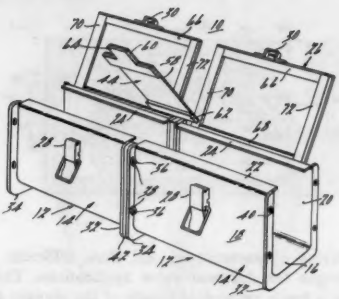
3,636,984

HINGED BRIDGING PLATES FOR LAY-IN WIREWAYS

Warren C. Rauhauser, Detroit, Mich., assignor to Keystone Columbia, Inc., Warren, Mich.

Filed Feb. 4, 1971, Ser. No. 112,703
Int. Cl. H02g 3/04, 3/06
U.S. Cl. 138—155 **16 Claims**

This invention relates generally to a lay-in wireway comprising a plurality of hollow rectangular channel sections secured in end-to-end relation and provided with hinged covers which overlap similarly hinged bridging plates disposed therebetween. The bridging plates are provided with resilient gaskets which sealingly engage the open sides of the channel sections and the covers are similarly provided with gaskets which sealingly engage the tops of the bridging plates.

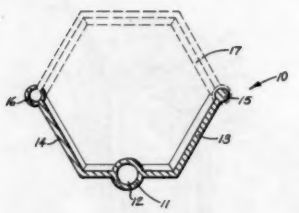


3,636,985

TUBULAR STEEL SHEETING

Keith L. Burchett, 26 Valley Road, Beloit, Wis.

Filed Mar. 16, 1970, Ser. No. 19,862
Int. Cl. F16l 9/22
U.S. Cl. 138—162 **1 Claim**



Tubular material having a longitudinal opening for the passage of an auger or other devices. This tubular structure includes side pieces of a desired width which are set at the center of the longitudinal opening of the sheeting and may be used for various purposes.

3,636,986

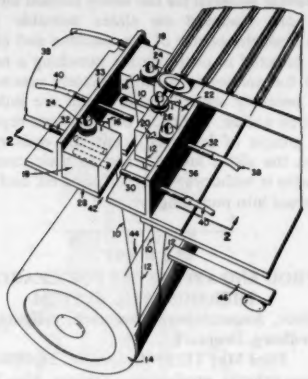
OPEN BACK SHED LOOM

Thomas W. Langley, Bon Air, and Robert A. Cloud, Richmond, both of Va., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,219
Int. Cl. D03c 13/00
U.S. Cl. 139—17 **5 Claims**

A loom and method of looming weft filaments which cannot be wound, wherein the warp filaments are arranged at their upper end on carriages which move laterally to form an

open shed and wherein the weft filaments, which are cut into predetermined lengths, are dropped into endless belt carriers



which, in turn, deposit them in the open shed at each alternation of the carriages.

3,636,987

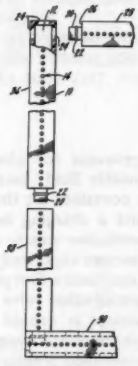
ADJUSTABLE WEAVING LOOM

Beverly B. Forby, 4980 North Marine Drive, Chicago, Ill.

Filed Mar. 11, 1970, Ser. No. 18,606

Int. Cl. D03d *29/00*

U.S. Cl. 139—34 **3 Claims**



An adjustable weaving loom made up of a plurality of loom sections, each of which has a top surface with a plurality of generally equally spaced upstanding knobs. The loom sections are held together by socketlike joints in which a projection on one loom section is inserted into an opening on an adjacent loom section. The cross section of the projection and opening are such that relative turning movement between the two sections is prevented.

3,636,988

APPARATUS AND METHOD FOR WEAVING FABRIC WITH INTRICATE PILE FORMATIONS

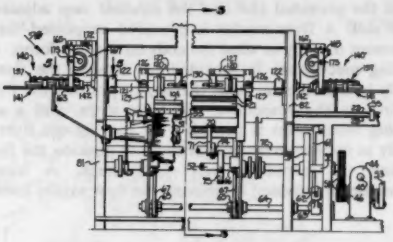
James E. Troy, and John T. MacIsaac, Jr., both of Eden, N.C., assignors to Fieldcrest Mills, Inc., Eden, Rockingham, N.C.

Filed Dec. 8, 1969, Ser. No. 882,851

Int. Cl. D03d *39/20*

U.S. Cl. 139—46 **51 Claims**

Utilizing the principle of shogging pile yarns above and across warpwise extending pile formers or wires in the weaving of pile fabrics this invention is directed to a method and apparatus in which a plurality of weftwise rows of vertically movable and weftwise movable pile yarn guides are employed and wherein the rows of pile yarn guides and the respective pile yarns are shogged weftwise varying amounts independently of each other under control of a pattern mechanism.



3,636,989

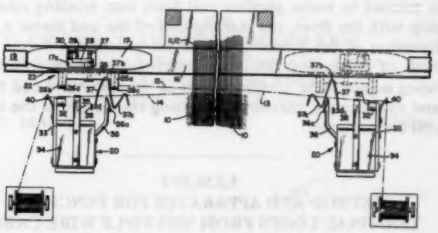
WIRE LOOM WITH BOBBINLESS WEFT INSERTING MEMBER

Adolf Rieker, Reutlingen, and Rudolf Boklen, Stuttgart, both of Germany, assignors to Hermann Finckh Metalltuch-und Maschinenfabrik, Reutlingen, Germany

Continuation of application Ser. No. 708,258, Feb. 26, 1968, now abandoned. This application Dec. 29, 1969, Ser. No. 888,169

Int. Cl. D03d *47/24*

U.S. Cl. 139—125 **13 Claims**



A loom for weaving wire cloth in which a supply of weft wire is provided at each side of the loom and a gripper-type shuttle is picked back and forth across the loom and draws weft wires alternately from said supplies. In each end position of the shuttle it is moved transversely to the picking direction thereof and the transverse movement is employed to release the shuttle from the weft wire last inserted and to connect the shuttle to the next weft wire to be inserted and to cut off the weft wire connected to the shuttle between the shuttle and the loom.

3,636,990

METHOD AND APPARATUS FOR WINDING DYNAMOELECTRIC MACHINE FIELD COILS

Robert J. Eminger, and William N. Brown, both of Fort Wayne, Ind., assignors to Fort Wayne Tool & Die Inc., Wayne, Ind.

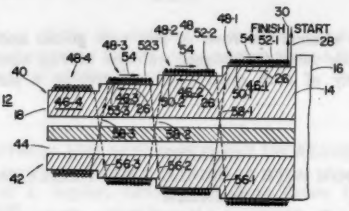
Filed Dec. 17, 1969, Ser. No. 885,684

Int. Cl. B21f *3/04*

U.S. Cl. 140—92.1 **23 Claims**

A method and apparatus for winding a plurality of interconnected dynamoelectric machine field coils providing in-

tercoil connections of minimum length. At least two coil forms are provided each having a distal end and a proximal end secured to a support, the coil forms extending radially outwardly from the support in angularly spaced relation. Each coil form has at least two steps with the largest step adjacent the proximal end and the smallest step adjacent the distal end. A flyer-winder is provided supported for axial movement thereby to wind the coils on the coil forms. A first latching mechanism is provided for moving the flyer forwardly in incremental steps thereby to position the flyer for winding on the respective coil form steps, and a second latching mechanism is provided for moving the flyer rearwardly in incremental steps, likewise to position the flyer for winding on respective coil form steps. A traversing mechanism is provided for moving the flyer axially thereby to



traverse the flyer across the coil form independently of the incremental steps provided by the latching mechanisms. With this construction, a part of a coil on one coil form is wound progressing in a forward direction from the proximal end toward the distal end with the starting end of the coil being adjacent the proximal end, and the remaining part of the coil is wound in a direction progressing rearwardly from the distal end toward the proximal end with the finishing end of the coil being adjacent the proximal end. Thus, when the support is rotated to move another coil form into winding relationship with the flyer, the starting end of the coil forms a continuation of the finishing end of the previously wound coil, both of these ends and the interconnection therebetween being adjacent the proximal ends of the respective coil forms and the support, thereby minimizing the length of the intercoil connections.

3,636,991

METHOD AND APPARATUS FOR PUNCHING TERMINAL LOOPS FROM MULTIPLE WIRE CABLE

Adrian D. Webster, Huntington Beach, Calif., assignor to Spectra-Strip Corporation, Garden Grove, Calif.

Filed Dec. 3, 1969, Ser. No. 881,730
Int. Cl. B21f *1/00*
U.S. Cl. 140—105 **19 Claims**

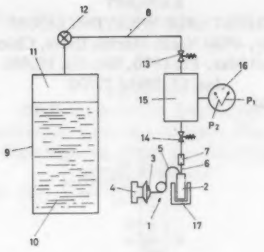
The method and apparatus for punching terminal loops from multiple wire flat ribbon cable in which the wires are pulled bodily relative to their own loose insulation as the loops are formed to avoid wire drawing and reduction in cross section of the wire. The loops extend at right angles to the plane of the cable and are longitudinally and transversely spaced in groups in a staggered pattern. The loops are started adjacent the middle of the cable and are progressively formed toward each end, with immediately preceding loops forming anchoring points holding the wires, while new groups of loops are being pressed out toward the opposite ends. The wires are bodily slid within their insulating jackets from the ends to provide material for the newly formed loops. Punches and dies are mounted on slides movable in opposite directions from the center of the machine and cable and the slides are indexed in positions for punching a new group of loops and for anchoring an immediately preceding formed group by properly spaced lights which are indexed with a photocells on a slide. The cycle of operations repeats through the final groups of loops adjacent the ends of the cable whereupon the slides are returned to their central position and the cable is withdrawn, its ends sheared, and a new cable blank inserted into punching position.

3,636,992

METHOD AND APPARATUS FOR CHARGING A THERMOSTATIC SYSTEM

Eric Weidner, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed May 11, 1970, Ser. No. 36,000
Claims priority, application Germany, May 7, 1969 P 19 23 370.6
Int. Cl. B65b *31/00*
U.S. Cl. 141—4 **5 Claims**



A method and apparatus for charging a thermostatic system with a condensable fluid. Essential parts of the apparatus are a storage container for the condensable fluid, a metering container and a charging head. The condensable fluid in the storage container exerts a vapor pressure and, with the use of valve means, vaporized fluid is caused to flow to the metering container until a first predetermined pressure is reached. With the use of other valve means vaporized fluid in the metering container is caused to flow through the charging head to the thermostatic system to be charged until a second lower predetermined pressure is reached. A reducing valve is between the storage container and the metering container to effect a superheated condition for the fluid flowing to the metering container.

3,636,993

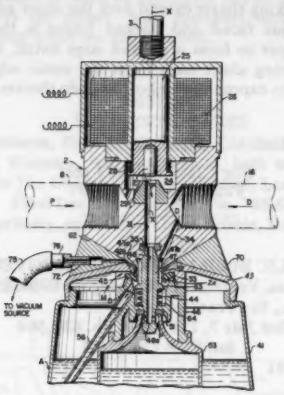
ADAPTER FOR FILLING HEAD FOR FILLING AEROSOL DISPENSER

Marvin L. Thornton, Bayside, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 31, 1968, Ser. No. 788,245
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—20 **2 Claims**

An adapter for positioning between a filling head and an aerosol-type dispenser having a separate product container. The adapter is an annular member having the upper surface tapered with a taper complementary to the taper of the lower surface of the filling head and the lower surface tapered with a taper complementary to the taper of the upper surface of the dispenser. The axial dimension of the annular member at the inner periphery thereof is sufficient to space the filling head from the dispenser. The annular member has at least

one air escape passage extending from the inner periphery thereof to the outer periphery thereof to which vacuum



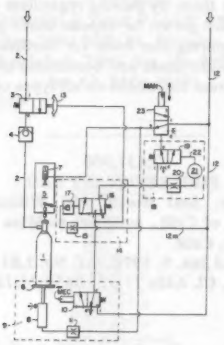
means can be connected to assist in air withdrawal as the product container is filled.

3,636,994

PNEUMATIC CONTROL DEVICE

Gustaf Lennart Lilljeforss, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Mar. 16, 1970, Ser. No. 19,788
Claims priority, application Sweden, Mar. 15, 1969, 3526/69
Int. Cl. B65b *1/32, 3/28*
U.S. Cl. 141—83 **11 Claims**



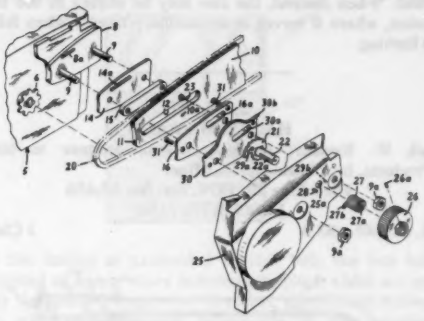
A pneumatic control device for automatic charging of containers placed on a weighing machine with one or more substances. The control device comprises a manually operable starting valve actuating a delay circuit to operate the weighing machine. After this, a delay circuit together with a shutoff valve controlled by the weighing machine and arranged in a weighing valve circuit actuate a main valve in one of the supplying conduits, selected by an alternating or selecting circuit. Having charged all the determined substances the control device is reset to the initial position by a reset circuit giving an impulse to the starting valve.

3,636,995

TENSIONER FOR SAW CHAIN

Albert K. Newman, Noroton, Conn., assignor to Textron, Inc., Providence, R.I.

Filed July 2, 1970, Ser. No. 51,988
Int. Cl. B27b *17/14*
U.S. Cl. 143—32 J **16 Claims**



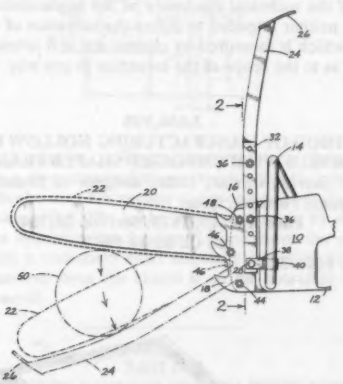
A chain saw is provided with means for tensioning the cutting chain to compensate for wear and thermal expansion during operation. The chain guide bar is slidably mounted on the chain saw frame so as to be movable longitudinally toward and away from the chain-driving sprocket. A spring-operated cam rotatably mounted on the frame engages a pin on the guide bar to move it in a direction away from the driving sprocket and thereby tighten the chain. The cam has a generally spiral cam contour with equally spaced cusps and intervening concavities.

3,636,996

CHAIN SAW ANTIPINCH GUARD ARM

Donald D. Lanz, Route 2, Box 155, Oregon City, Oreg.

Filed Dec. 12, 1969, Ser. No. 884,456
Int. Cl. B27b *17/02*; **B27g** *19/06*
U.S. Cl. 143—32 F **7 Claims**



An antipinch guard arm for chain saw blades comprises a stiff, strong arm and pivotal mounting means mounting one end of the arm on the saw in a plane parallel to the plane of the saw blade. The arm is pivotal between a first position, downwardly divergent from the blade, a second position substantially parallel and adjacent to the blade, and a third position, upwardly divergent from the blade. At the beginning of the saw operation, the blade is placed on one side of a log or

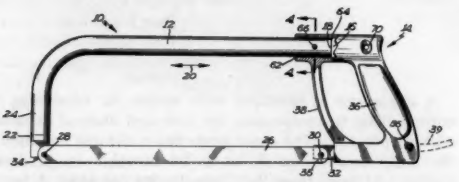
other object to be sawn and the arm in its downwardly divergent position on the opposite side. The free end of the arm is braced against the ground or other support. The chain saw then is applied to the log in the usual manner. As the cut progresses, the blade moves in the direction of the arm, which supports the object from the opposite side and thus prevents pinching. At the conclusion of the cut, the arm lies in its second position immediately adjacent the blade, where it protects the saw chain from damage by contacting the ground. When desired, the saw may be shifted to the third position, where it serves as an auxiliary handle when felling and limbing.

3,636,997

HACKSAW FRAME

Mark W. Keymer, Hopkins, Minn., assignor to Malco Products, Inc., Minneapolis, Minn.

Filed June 29, 1970, Ser. No. 50,456
Int. Cl. B27b *21/06*
U.S. Cl. 145—33 A **3 Claims**



A hacksaw frame with a frame arm telescopically adjustable within a socket in a handle assembly, the frame arm being locked in operating position within the socket and a blade simultaneously tensioned by a movable lever on the handle assembly. Moving the lever from an open to a locked position cocks and binds the frame arm within the socket thereby rigidly securing the hacksaw frame in operating position.

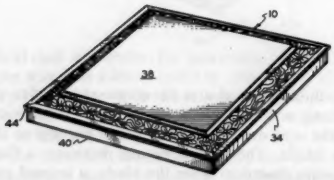
The purpose of the foregoing abstract is to enable the Patent Office and the public generally, and especially the scientists, engineers, or practitioners in the art who are not familiar with patent or legal terms of phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,636,998

METHOD OF MANUFACTURING HOLLOW CORE PANELS WITH EMBOSSED SHAPED FRAMES

John L. Sarrail, Covina, Calif., assignor to Evans Products Company, Portland, Oreg.

Filed Apr. 15, 1970, Ser. No. 28,754
Int. Cl. B27m *1/00*
U.S. Cl. 144—328 **9 Claims**



A method of making hollow core panels and like structures having an embossed shaped frame comprises cutting a dado into the face of a piece of frame stock parallel to the outer edge thereof, embossing a design into such dado along the length thereof and forming a frame from the piece of frame stock. A facing sheet is adhered to the embossed face of the frame and a backing sheet to the back of the frame, and such facing and backing sheets extend over the outer edges of the frame. The thus faced and backed frame is then passed through a shaper to form a desired edge detail, the shaper cutting the facing sheet back from the outer edges of the frame at least to expose the embossed dado therein.

ERRATUM

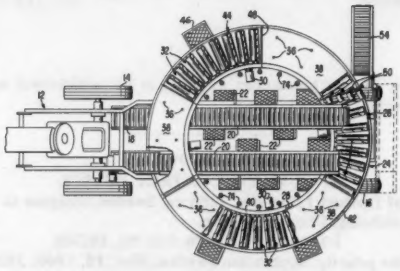
For Class 145—33 see:
Patent No. 3,636,997

3,636,999

GARLIC BULB APPENDAGE REMOVER

Henry P. Cordes, Vacaville, Calif., assignor to Basic Vegetable Products Inc., San Francisco, Calif.

Filed July 7, 1969, Ser. No. 839,364
Int. Cl. A23n *15/04*
U.S. Cl. 146—81 **6 Claims**



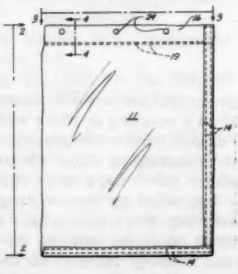
Apparatus for pulling tops and root tendrils from garlic bulbs. Multiple sets of opposed rolls with firm resilient surfaces engage the protruding tops and roots of gently rotating bulbs and remove them by pulling regardless of the stage of the maturity of the garlic, to expose inner portions of the bulb thereby preparing the bulb for further processing or marketing. Treatment times and conditions are widely variable allowing optimum treatment on all types of feedstock encountered.

3,637,000

FIRE-RESISTANT BAG

Philip F. Walger, Seal Beach, and William F. Walger, Pasadena, both of Calif., assignors to Minx Products, Inc., South El Monte, Calif.

Filed Jan. 9, 1970, Ser. No. 1,811
Int. Cl. A45c *11/22*; B65d *33/16*
U.S. Cl. 150—3 **5 Claims**



A fire-resistant bag for carrying valuable documents or money. The bag has a multilayer sidewall with plies which

are separated by heat-insulating air spaces. Each ply includes a sheet of asbestos or similar heat-insulating material, and one ply has a metal-foil outer face for reflecting heat. A zipper closure is provided, and the zipper is protected from direct exposure to flame by multilayer lips or flaps on the bag which cover the zipper. Snap fasteners secure the zipper cover in place when the bag is closed.

3,637,001

PNEUMATIC TYRES

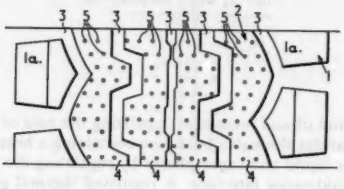
Glyn B. Roberts, Four Oaks, Sutton Coldfield, and Thomas Holmes, Walmley, Sutton Coldfield, both of England, assignors to The Dunlop Company Limited, London, England

Filed Dec. 20, 1968, Ser. No. 785,626

Claims priority, application Great Britain, Dec. 28, 1967, 58,833/67

Int. Cl. B60c *11/10*

U.S. Cl. 152—209 **10 Claims**



A pneumatic tire particularly adapted for use over water wet surfaces having a tread portion provided with water-absorbing chambers of relatively small cross-sectional area at the ground-contacting surface of the tread, such as cylinders of small diameter, extending radially inwardly into the tread, for absorbing water during contact of the chamber with the water wet surface, and ejection of absorbed water at a later stage in a revolution of the tire.

3,637,002

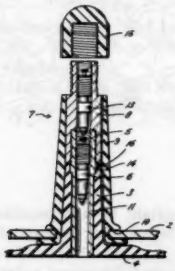
AUTOMOBILE TIRE VALVE ADAPTER

George W. Hughes, 2601 Mills St., Houston, Tex.

Filed July 2, 1969, Ser. No. 838,576

Int. Cl. B60c *29/00*

U.S. Cl. 152—429 **1 Claim**



A pneumatic tire valve adapter to be mounted on the valve stem extending from an inner tube, and having a flexible valve stem mounted on said inner tube valve stem, and having a peripheral groove at the bottom thereof adapted to be received by the edge of the valve stem orifice in the vehicle wheel, to seal the annulus between the inner tube and casing, and a valve core in each of said valve stems through which air is admitted into the inner tube.

3,637,003

COMPOSITE BREAKER BELT FOR RADIAL PLY TIRE

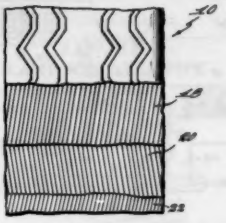
Brian Edward Clapson, Cwmbran, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 2, 1966, Ser. No. 577,023

Claims priority, application Great Britain, Sept. 2, 1965, 37,513/65

Int. Cl. B60c *9/18*

U.S. Cl. 152—361 **5 Claims**



A tire having an embedded breaker belt, the belt being composed of one or more intermediate plies, which are relatively rigid in the lengthwise direction, sandwiched between plies which are relatively deformable in the lengthwise direction. The intermediate plies may be rayon, and the sandwiching plies may be nylon.

3,637,004

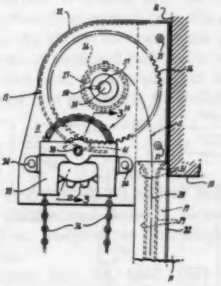
ROLLING DOOR OPERATING MECHANISM

Russell Wardlaw, San Rafael, and Robert Peter Cole, San Francisco, both of Calif., assignors to The Cookson Company, San Francisco, Calif.

Filed Oct. 24, 1969, Ser. No. 869,212

Int. Cl. E06b *9/08, 9/208*

U.S. Cl. 160—133 **8 Claims**



A clutch for a rolling door operating mechanism safeguards a door counterbalance mechanism by actuating a rotatable brake member against a stationary drum should the counterbalance fail. The brake is released again by normally driving the operating mechanism. In one form, the clutch is arranged on a stationary shaft coaxially with the driving input; in a second form the clutch is on the rotatable shaft of the door barrel.

3,637,005

REFRIGERATION DEFROST SYSTEM WITH CONSTANT PRESSURE HEATED RECEIVER

Otto J. Nussbaum, Allison Park, Pa., assignor to Halstead Industries, Inc., Zelienople, Pa.

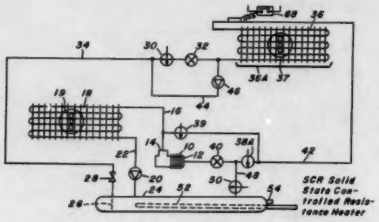
Filed Feb. 5, 1970, Ser. No. 8,873

Int. Cl. F25b *29/00*

U.S. Cl. 165—17 **7 Claims**

A compression-type refrigeration system utilizing a conventional suction line as a defrost conduit and including means for heating a liquid refrigerant in the receiver of the

system to maintain the refrigerant at a predetermined pressure and temperature to serve as a source of heat during a defrost cycle. The power supplied to the heating means is regulated, preferably by semiconductive controlled rectifiers



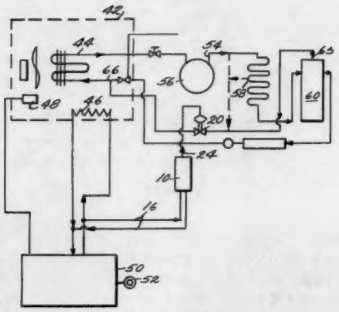
utilizing phase commutation techniques, such that the pressure within the receiver is maintained substantially constant at all times and does not vary even if the receiver is located exteriorly of a building enclosure where it may be exposed to low temperatures.

3,637,006

PROPORTIONING CONTROL UNIT

Thomas K. Decker, Marietta, Ohio, assignor to Forma Scientific, Inc., Marietta, Ohio

Filed Apr. 8, 1970, Ser. No. 26,739
Int. Cl. F25b *29/00*
U.S. Cl. 165—26 **19 Claims**



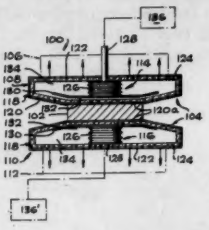
A control device for producing a first control variable or parameter substantially proportional to the duty cycle or ratio of "on" to "off" times of a second variable by heating a block of metal or other thermally conducting material during the "on" time of the second variable and utilizing the resultant block temperature or some other proportional variable as a control variable. In the preferred embodiment of this invention, the block temperature is used to establish the temperature and hence pressure of a closed body of fluid which pressure may be connected for use as a control variable. Several specific temperature regulation systems using such a control device in a refrigeration system are also enclosed.

3,637,007

METHOD OF AND MEANS FOR REGULATING THERMAL ENERGY TRANSFER THROUGH A HEAT PIPE

Arnold P. Shlosinger, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Original application Aug. 14, 1967, Ser. No. 660,400, now Patent No. 3,502,133, dated Mar. 24, 1970. Divided and this application Dec. 29, 1969, Ser. No. 888,255
Int. Cl. F28f *15/0*
U.S. Cl. 165—32 **7 Claims**



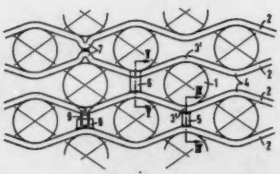
A method of and means for regulating the rate of thermal energy transfer through a heat pipe containing a heat transfer fluid in its liquid and vapor phases by regulating the pressure at the liquid-vapor interface. A regulated thermal generator embodying thermally regulated heat pipe means for transmitting thermal energy at a controlled rate to a heat sink or thermal load.

3,637,008

HOLDER FOR U-TUBE BUNDLES OF STEAM GENERATORS

Eberhard Michel, Nurnberg, and Hans Mayer, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Sept. 18, 1969, Ser. No. 859,088
Claims priority, application Germany, Sept. 20, 1968, P 17 76 098.4
Int. Cl. F28f *9/00*
U.S. Cl. 165—69 **7 Claims**



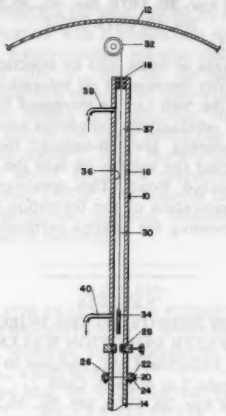
In substantially upright U-tube bundles of steam generators, tube holders located at substantially horizontally extending turns of the U-tube bundles and comprising a plurality of wave-shaped bands disposed substantially parallel to one another between respective rows of tubes located in the same plane, the waves of each of said bands forming respective bulges, adjacent bands being disposed relative to one another so that the bulges thereof alternately face away from and toward one another, the respective pairs of bulges facing away from one another defining spaces therebetween respectively for receiving individual tubes therein, the bulges facing toward one another being firmly secured to and prestressed toward one another.

3,637,009

LUBRICATOR ASSEMBLY DEVICE

Theodore K. James, Norman, Okla., assignor to Transworld Drilling Company, Oklahoma City, Okla.

Filed Aug. 19, 1969, Ser. No. 851,197
Int. Cl. E21b 33/035
U.S. Cl. 166—.5 9 Claims



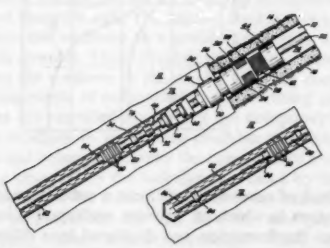
The invention provides a well lubricator assembly device which is capable of eliminating or substantially minimizing contamination of the surrounding area in which it is used, from leaking oil and gas. The lubricator device is in the form of an elongated tubular member adapted for mounting on the top of the wellhead of an oil or gas well. A wire line is provided to pass through the lubricator to lower a tool or other workpiece into the well. Seals to pack off around the wire line are provided at the top of the lubricator and near the end which is affixed to the wellhead. A chamber is provided between the two seals for the passage of a circulating fluid. The lubricator is adapted for use on wells located on land as well as those submerged under water such as in the ocean. In the latter case, the device is adapted to be transported by and used in a chamber which may be submersed into mating relation with the well to provide a watertight working area.

3,637,010

APPARATUS FOR GRAVEL-PACKING INCLINED WELLS

George P. Maly, Newport Beach, and Joel P. Robinson, Santa Ana, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 4, 1970, Ser. No. 16,502
Int. Cl. E21b 43/04
U.S. Cl. 166—51 6 Claims



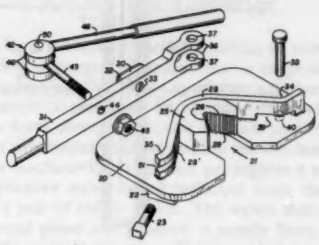
Apparatus is disclosed for hydraulically placing a uniform gravel pack in a well around the exterior of a perforate liner, and especially for forming uniform gravel packs in wells inclined from the vertical. The apparatus is comprised of a number of tubular members that can be axially assembled to form a stinger pipe that is attached to a conventional gravel-packing tool and placed in the interior of the perforate liner during the gravel-packing operation. A plurality of flexible, radial flow control baffles are slidably mounted on the tubular members so that the assembled tool is axially movable within the liner, within a limited travel, and rotatable independent of the baffles.

3,637,011

CLAMP FOR WELL PIPE

Eugene F. Wheeler, Franktown, Colo.

Filed Oct. 30, 1970, Ser. No. 85,360
Int. Cl. E21b 33/03
U.S. Cl. 166—77.5 6 Claims



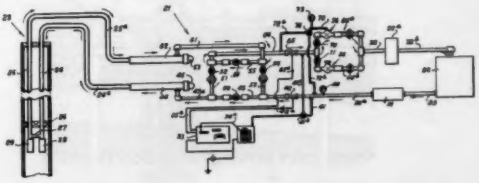
A clamp for holding a string of pipe suspended in a well. The clamp is mounted upon a flat plate which is secured to the well casing to prevent it from rotating. The plate has a throat at one side to receive a pipe suspended in the well and vertically splined jaws form a V-notched abutment at the crotch of the throat. A clamp arm having a horizontally splined head is pivotally mounted upon the plate to be pulled against a pipe in the throat to engage the pipe between the jaws and the head. A cammed pull rod connecting with the arm engages a cam seat on the plate to lock the jaws and head onto the pipe and prevent it from slipping and rotating in the clamp.

3,637,012

WELL FLOW CIRCULATING METHODS

Phillip S. Sizer, Dallas, and Harry E. Schwegman, Richardson, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Original application Nov. 14, 1967, Ser. No. 682,874, Pat. No. 3,608,631. Divided and this application Oct. 20, 1969, Ser. No. 870,617
Int. Cl. E21b 41/00, 43/12
U.S. Cl. 166—250 12 Claims



A system and method for pumping tools into and out of a well through fluid circulation passages in the well including fluid input and return passages communicating with each other in the well bore and with surface apparatus for controlling fluid flow through said passages. The surface apparatus includes a manifold system for directing flow through the well circulation passages in either direction and includes

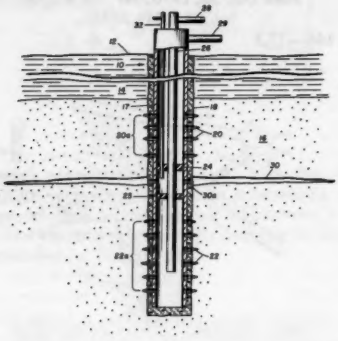
variable choke means in the fluid return portion of the manifold for a controlled back pressure on the well passages and pressure and flow rate measuring means for monitoring fluid flow in the well passages.

3,637,013

IN SITU COMBUSTION PROCESS USING TIME-DEPENDENT SHEAR-THINNING LIQUID BARRIER

Lloyd G. Jones, Dallas, Tex., assignor to Mobil Oil Corporation

Filed Mar. 2, 1970, Ser. No. 15,702
Int. Cl. E21b *33/138, 43/24*
U.S. Cl. 166—257 **5 Claims**



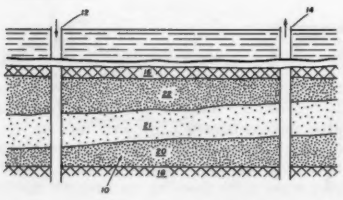
In situ combustion processes in which a barrier formed of a time-dependent shear-thinning liquid is employed to control the vertical migration of the combustion front. The reservoir is fractured in order to form a horizontally extending fracture between the injection and production systems employed in the combustion drive. Thereafter a time-dependent shear-thinning liquid is introduced into the fracture. This liquid undergoes an increase in viscosity with time in order to form the barrier. The invention may be employed in conjunction with in situ combustion drives carried out in multiply completed wells or in horizontally spaced injection and production wells.

3,637,014

SECONDARY OIL RECOVERY PROCESS USING TIME-DEPENDENT SHEAR-THINNING LIQUID

Lloyd G. Jones, Dallas, Tex., assignor to Mobil Oil Corporation

Filed Mar. 2, 1970, Ser. No. 15,553
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **6 Claims**



Secondary oil recovery process in which at least a portion of the driving fluid injected into the oil reservoir is a time-dependent shear-thinning liquid. The time-dependent liquid retains a relatively low viscosity induced by the shear rates encountered during injection and thereafter undergoes an increase in viscosity with time. As the viscosity of the time-dependent liquid increases, it functions to increase the sweep efficiency of the secondary recovery process.

3,637,015

METHOD FOR IMPROVING THE INJECTIVITY OF BRINE INTO WATER INJECTION WELLS

Le Roy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 20, 1970, Ser. No. 30,240
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **10 Claims**

The injection rate of brine into an injection well that exhibits low injectivity because of oil saturation in the formation adjacent to the well can be increased by introducing a small quantity of substantially anhydrous soluble oil into the well, then introducing low-salt-content fresh water, and thereafter displacing the soluble oil into the formation with subsequently injected brine. This treatment substantially reduces the oil saturation of the formation adjacent to the well, thereby increasing the relative permeability of the formation to brine.

3,637,016

METHOD FOR IMPROVING THE INJECTIVITY OF WATER INJECTION WELLS

LeRoy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 20, 1970, Ser. No. 30,241
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **15 Claims**

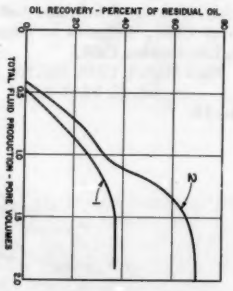
The injection rate of water into an injection well that exhibits low injectivity because of oil saturation in the formation adjacent to the well can be increased by alternately introducing into the well a series of successive small quantities of substantially anhydrous soluble oil and low salt-content water, and thereafter injecting flood water through the well and into the formation. This technique is particularly useful for improving the injectivity of wells penetrating relatively thick and/or heterogeneous formations.

3,637,017

SURFACTANT FLOODING PROCESS

Walter W. Gale, and Euell R. Rorie, both of Houston, Tex., assignors to Esso Production Research Company

Filed June 1, 1970, Ser. No. 42,358
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 **18 Claims**



A method of recovering oil from a subterranean oil-bearing formation in which an aqueous surfactant solution is injected into the formation and displaced by a dilute solution of alcohol in water. In another embodiment, the alcohol and surfactant are contained in the same solution and this solution is displaced through the formation to recover oil.

3,637,018

IN SITU RECOVERY OF OIL FROM TAR SANDS USING WATER-EXTERNAL MICELLAR DISPERSIONS

Joe T. Kelly, deceased, late of Littleton, Colo. (by Laverne S. Kelly, executrix), and Fred H. Poettmann, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 29, 1969, Ser. No. 888,897
Int. Cl. E21b *43/22, 43/24*
U.S. Cl. 166—272 19 Claims

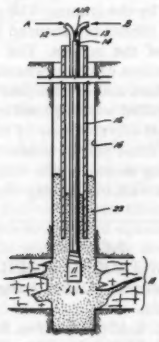
Oil from subsurface tar sand having an injection means in fluid communication with a production means is recovered by injecting a water-external micellar dispersion at a temperature above 100° F., into the tar sands, displacing it toward the production means and recovering the oil through the production means. The micellar dispersion can be preceded by a slug of hot water which can optionally have a pH greater than about 7. Also, the micellar dispersion can have a pH of about 7–14 and preferably a temperature greater than about 150° F. The micellar dispersion contains hydrocarbon, surfactant, aqueous medium, and optionally cosurfactant and/or electrolyte.

3,637,019

METHOD FOR PLUGGING A POROUS STRATUM PENETRATED BY A WELLBORE

Jimmy D. Lee, Houston, Tex., assignor to Dalton E. Bloom, Houston, Tex., a part interest

Filed Mar. 16, 1970, Ser. No. 19,977
Int. Cl. E21b *33/138*
U.S. Cl. 166—295 5 Claims



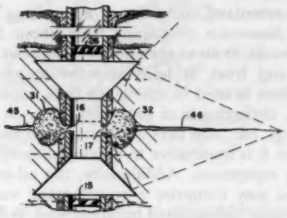
The apparatus includes a mixing head forming a mixing chamber communicating with the wellbore, with the chamber having baffle means therein for creating turbulence as fluids are flowed therethrough. The mixing head is arranged for insertion into the wellbore to a position generally adjacent to the porous stratum. Three conduit means are arranged to extend down the wellbore to the mixing head for conducting A and B components of polyurethane and a mixing gas such as air. Means are provided for forcing the components and gas down the conduits to the mixing chamber at predetermined pressures and volumes whereby the components are mixed in the mixing chamber by the turbulence created by the gas and baffle means, and the mixing chamber is maintained clear of hardened polyurethane by the flow of the gas or fluid therethrough. After the polyurethane which has been deposited in the wellbore has set up, it may thereafter be drilled through, with the hardened polyurethane consolidating the lost circulation zone adjacent the wellbore.

3,637,020

TENSILE-STRESS FRACTURING

Roy T. McLamore, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed July 18, 1969, Ser. No. 842,852
Int. Cl. E21b *43/26*
U.S. Cl. 166—298 6 Claims



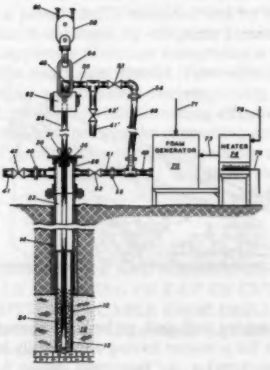
In fracturing a subsurface earth formation, an oriented tensile stress that is focused in a plane that is perpendicular to the axis of a borehole is utilized to initiate a horizontal fracture. The stress is produced by notching the walls of the borehole to form diverging conical surfaces and detonating an explosive substantially midway within the confined section between the notches. The explosion propagates a semicylindrical compressive wave and is reflected from the conical surfaces as a pair of tensile waves. The waves then intersect on a horizontal plane and generate a tensile force which is focused in the vertical direction. The net result is a horizontal fracture along the plane of intersection of the two reflected tensile waves.

3,637,021

METHOD AND APPARATUS FOR REMOVAL OF PETROLIFEROUS ADHERENT SOLIDS FROM AN INACCESSIBLE SURFACE

Stanley O. Hutchison, Bakersfield, and John C. McKinnell, Taft, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 30, 1970, Ser. No. 7,062
Int. Cl. E21b *21/00*
U.S. Cl. 166—302 9 Claims



Petroliferous solid matter adhering to an inaccessible surface, such as the well bore in the producing zone of an oil well, are removed by contact of the solid with aqueous gas-in-liquid foams having a temperature above 140° F.

3,637,022

USE OF HIGH WATER CONTENT OIL-EXTERNAL MICELLAR SOLUTIONS FOR EXTINGUISHING FIRES

Joe T. Kelly, deceased, late of Littleton, Colo. (by La Verne S. Kelly, executrix), and Jack L. Hummel, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Oct. 30, 1969, Ser. No. 873,732
Int. Cl. A62d *1/00*
U.S. Cl. 169—1 **12 Claims**

A fire-retardant composition comprising an oil-external micellar dispersion containing from about 50 to about 90 percent water, from at least about 3 to about 15 percent surfactant, and from at least about 4 to about 40 percent hydrocarbon is used to extinguish fires, especially hydrocarbon fires, occurring in or near water (e.g. on ships), offshore drilling rigs, etc., and fires occurring in oil and refining facilities where it is imperative to quickly remove the burning oil from the equipment. Additionally, the oil-external micellar dispersion may comprise a cosurfactant, various fire-extinguishing salts, halogenated hydrocarbons, gelling agents, corrosion inhibiting agents, and coloring agents.

3,637,023

METHOD OF HARVESTING PEANUTS

George C. Wood, P.O. Box 448, Edenton, N.C.

Continuation of application Ser. No. 751,722, Aug. 12, 1968, now abandoned. This application Aug. 28, 1970, Ser. No. 68,011
Int. Cl. A01d *29/00*
U.S. Cl. 171—1 **7 Claims**

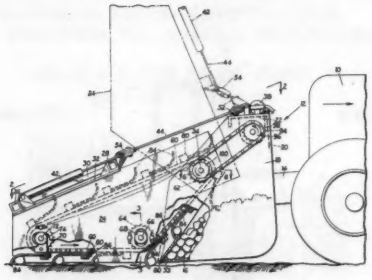
The peanut vines with the peanuts adhering thereto are first dug and deposited with their vines or a portion of them buried in the ground and the peanuts extending upwardly therefrom so that they may be accessible for harvesting either by hand or by machinery after several days. In this manner the familiar flavor of the peanuts is retained and the development of mold or other injurious organism is prevented or deterred.

3,637,024

TRACTOR MOUNTED, GROUND-RAKING AND ROCK-GATHERING APPARATUS

Theodore N. Baskett, 9514 Portland Ave., Tacoma, Wash.

Filed May 14, 1970, Ser. No. 37,244
Int. Cl. A01b *43/00*
U.S. Cl. 171—63 **10 Claims**



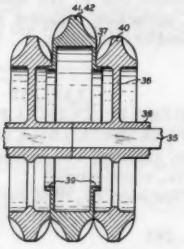
Ground-raking and rock-gathering apparatus comprises an attachment for a tractor having a forwardly located, material-handling bucket, i.e., a "front end loader." The attachment includes a rotatably mounted endless, flexible support having mounted thereon a plurality of raking teeth. Pivotal mounting means mount one end of the support on the bucket with the support extending forwardly of the bucket in upper and lower runs. The lower run is arranged to deliver to the bucket solid objects gathered by the teeth. Drive means are connected to the support for driving it in a rotational direction predetermined to move the lower run in the direction of the bucket. Elevating means are connected to the support for moving it angularly about the pivotal mounting means between raised and lowered positions.

3,637,025

POWER DRIVEN CULTIVATOR

Otto Rosenkranz, Sonke-Nissen-Koog near Husum, and Cornelius Jensen, Sollwitt near Husum, both of Germany, assignors to Martin H. Ketelsen, Great Neck, N.Y., a part interest

Filed Apr. 3, 1969, Ser. No. 813,065
Claims priority, application Germany, Apr. 3, 1968, P 17 57 136.7
Int. Cl. A01b *33/02, 35/28*
U.S. Cl. 172—52 **6 Claims**



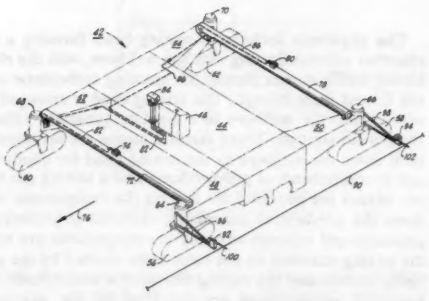
A power driven cultivator which comprises frames and a plurality of rollers which are rotatably mounted in the frames. A driving motor is operatively connected with the rollers and supported by the frames. The rollers are equipped with ribs and bearing means are secured to the frame for the rotatable mounting of the rollers. The latter are coupled together in pairs by means of chain wheels and chains to provide a rear pair of rollers and a front pair of rollers. The rear pair of the rollers is pulled and disposed in the frame at a gap behind two of the front drivable pair of rollers. A platform is disposed between the front pair of rollers supporting the driving motor and coupling means, chain wheels and a chain are operatively connected with the driving motor.

3,637,026

CROSS SLOPE CONTROL OF MOBILE MACHINERY

Ralph K. Snow, Oklahoma, Okla., assignor to CMI Corp., Oklahoma City, Okla.

Filed Oct. 6, 1969, Ser. No. 864,122
Int. Cl. E02f *3/76*; E01c *19/48*
U.S. Cl. 172—4.5 **6 Claims**



Apparatus for controlling the cross slope of mobile machinery relative to an external reference such as a string

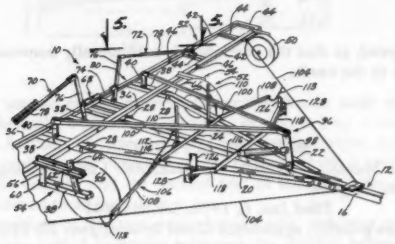
line. The apparatus consisting of accelerometer assemblies affixed at selected transverse midpoints of the machinery to provide a continual electrical output proportional to the cross slope angle of the machinery, whereupon this continual output is compared to a reference voltage selected in accordance with the desired cross slope angle to provide a further control output for use in keeping or repositioning the tilt angle of the machinery so that it is continually maintained at a desired cross slope angle. Such cross slope control assembly works in conjunction with machinery elevation control mechanisms responsive to a string line or other external reference such that cross slope is maintained with respect to an established level.

3,637,027

HYDRAULICALLY FOLDABLE SOIL CONDITIONER

Henry L. Kovar, Osseo, Minn., assignor to John R. Kovar Mfg. Co., Inc., Anoka, Minn.

Filed Aug. 19, 1970, Ser. No. 65,033
Int. Cl. A01b *49/00, 63/32, 65/04*
U.S. Cl. 172—311 **20 Claims**



A foldable soil conditioner includes a main frame and a wing frame hinged adjacent the rearward end of the main frame. The wing frame includes a central member having two wing members hinged to its opposite ends. A pair of reinforcing chains interconnect the wing members with a forward portion of the main frame. A hydraulically operated linkage is adapted to swing the wing frame about its hinged connection with the main frame from an operable position wherein the hinged axes of the wing members are horizontal to an intermediate position wherein the hinged axes of the wing members are vertical. A takeup device is mounted on the main frame and includes swingable arms connected to the reinforcing chains so as to swing and lift them upwardly to take up any slack therein. A pair of levers is hinged to the main frame and is connected to the swingable arms for swinging them. A hydraulically operated mechanism interconnects both of the wing members and the central member and is adapted to swing the wing members towards the lateral sides of the main frame. This mechanism includes links which engage the aforementioned levers when the wing frame is in its intermediate position. When the mechanism is actuated it causes the wing members to fold and simultaneously causes the swingable arms to take up the slack in the reinforcing chains.

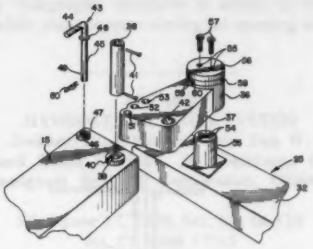
3,637,028

OFFSET DISK HARROW

Jerome L. Fueslein, Linden, and William M. Adams, Stockton, both of Calif., assignors to International Harvester Company, Chicago, Ill.

Filed June 8, 1970, Ser. No. 44,453
Int. Cl. A01b *23/04, 65/02*
U.S. Cl. 172—582 **5 Claims**

An offset disk harrow wherein the front and rear gangs are supported by a unitary frame structure to the ends of which each gang is connected by a single pivot, and wherein the frame structure includes articulated parts, one of which supports the rear gang and can be laterally angled relative to the



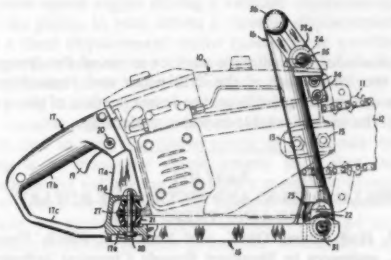
other frame part and rigidly held in selected adjusted positions to laterally shift the rear gang bodily relative to the front gang.

3,637,029

HAND-HELD POWER TOOL WITH ANTIVIBRATION MOUNT

Noble P. Sherwood, Jr., Greenwich, and James P. Strickland, Fairfield, both of Conn., assignors to Textron, Inc., Providence, R.I.

Filed Sept. 14, 1970, Ser. No. 71,829
Int. Cl. B27b *17/02*
U.S. Cl. 173—162 **13 Claims**



A hand-held power tool comprises an internal combustion engine on which a power tool is mounted and by which it is driven. The engine is mounted by vibration isolators on an essentially rigid supporting structure comprising a base portion, a front handle and a rear handle. Four vibration isolators are so arranged as to isolate the supporting structure from vibration of the engine while providing effective control of the tool by an operator holding the supporting structure by the front and rear handles. The vibration isolators are shown in the form of hollow barrel-shaped bodies of elastomeric material.

3,637,030

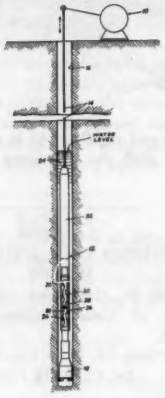
COMPOSITION FOR AND METHOD OF SUBSTANTIALLY REDUCING PILE-UP OF CUTTINGS ON HOLE BOTTOM IN CABLE DROP DRILLING

Allen E. Bardwell, Princeton, N.J., assignor to Trident Industries, Inc., Princeton, N.J.

Filed Jan. 7, 1970, Ser. No. 1,180
Int. Cl. E21b *21/04*
U.S. Cl. 175—65 **9 Claims**

This is a composition for and a method of rapidly materially increasing the viscosity of the water and increasing the lubricity effect on suspended cuttings in cable drop drilling to float the cuttings to provide a relatively clear area for each drill impact and to coat the cuttings to reduce the wear on

the drill in its impact therewith. The composition comprises substantially two-thirds calcium chloride and one-third Galactomannan, a Guar bean product. About one ounce of the composition is added to each gallon of drill water. The



method includes depositing a sack or more of the composition in the lower part of the drill water and rupturing the same on drilling to quickly gel the lower portion of the water column. The sack is soluble in water preferably.

3,637,031

DRILLING FLUID AND METHOD OF ROTARY DRILLING THEREWITH

Jerry D. Hull, Tulsa, Okla., and Robert E. Finch, Denver, Colo., assignors to Standard Brands Chemical Industries, Inc., Dover, Del.

Filed Dec. 12, 1969, Ser. No. 884,718

Int. Cl. B01d *21/01*; **C10m** *3/30*

U.S. Cl. 175—66 **7 Claims**

Polyacrylamide homopolymer, in which the ratio of pendant amide groups to pendant carboxylic acid or carboxylic acid salt groups is between 130 and 500, is effective as either a selective or nonselective flocculation agent to remove cutting fines from aqueous rotary drilling fluids.

3,637,032

DIRECTIONAL DRILLING APPARATUS

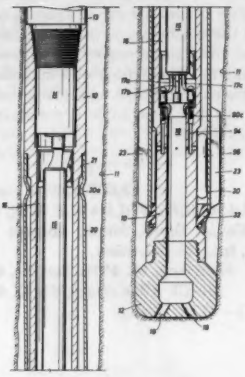
John D. Jeter, Route 1, Box 195, Cocoa, Fla.

Continuation-in-part of application Ser. No. 869,056, Oct. 24, 1969, now abandoned. This application Jan. 22, 1970, Ser. No. 4,943

Int. Cl. E21b *7/08*

U.S. Cl. 175—73 **25 Claims**

A pendulum is mounted in the drill pipe close to the drill bit to assume a vertical position in the azimuthal plane of the drill pipe. When the position of the pendulum is such that the inclination of the drill pipe is not a preselected amount or the azimuthal direction of the pipe is not the preselected direction, a lateral force is imposed on the drill bit urging it to drill in a direction that will return the drill pipe to said preselected inclination or azimuthal direction. The pendulum and its associated apparatus is rotated in the direction opposite the direction that the drill pipe is rotated and at the



same speed, so that the pendulum is substantially nonrotative relative to the earth.

3,637,033

DRILLING APPARATUS

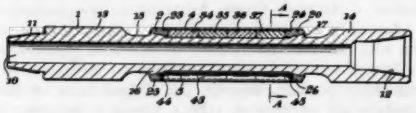
William Mayall, 6 Arundel Gardens, Ash Lane, Rustington, Sussex, England

Filed Jan. 6, 1970, Ser. No. 942

Claims priority, application Great Britain, Jan. 22, 1969, 3,566/69

Int. Cl. E21b *17/00, 31/06*

U.S. Cl. 175—320 **15 Claims**



The invention relates to an assembly for collecting magnetic waste material for insertion in the drill string of drilling apparatus.

The assembly includes a plurality of magnets held in place around a first nonmagnetic tubular member by means of a second nonmagnetic tubular member which is swaged around the magnets to form a longitudinally extending recess between each pair of magnets.

3,637,034

HYDRAULIC SCALE

Chester H. Wickenberg, 1125 Forest Drive, Elgin, Ill.

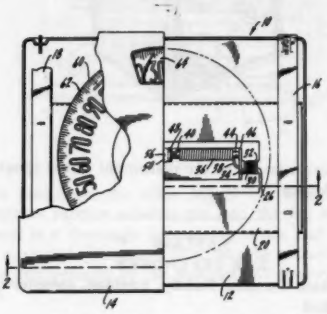
Continuation-in-part of application Ser. No. 880,092, Nov. 26, 1969, now abandoned. This application July 6, 1970, Ser. No. 52,593

Int. Cl. G01g *5/04*; **G01l** *7/02*

U.S. Cl. 177—208 **27 Claims**

There is disclosed a hydraulic weighing scale comprising a base member, a platform member mounted for vertical movement relative to the base member in response to a force being placed upon the platform, a bellows positioned between the platform and the base, lever means operatively

connected between the platform and one side of the bellows wherein vertical movement of the platform results in a pressure increase in the bellows, a helically coiled hydraulic tube having either a horizontal or vertical axis wherein the first end of the tube is connected to the second side of the bellows and an indicator connected to the second end of the hydraulic tube wherein the pressure increase from the bellows causes an expansion of the hydraulic tube thereby causing a displacement of the indicator means, the displacement being proportional to the downward force on the platform.



A second embodiment discloses a hydraulic scale wherein the helically coiled hydraulic tube is replaced by a hydraulic tube helically coiled in a clock spring configuration. As in the first embodiment, one end of the hydraulic tube is connected to the bellows and the second end of the hydraulic tube is connected to an indicator.

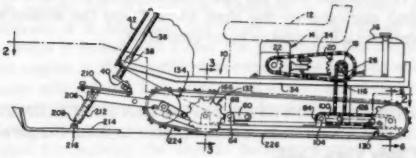
In either of the two embodiments, the indicator and the helically coiled hydraulic tube may be located between the base member and the platform member or they may be located remotely to or externally from the platform member and base member.

3,637,035

SNOWMOBILE

Brice P. Washburn, Box 40-A, Los Lunas, N. Mex.

Filed Nov. 7, 1969, Ser. No. 874,890
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **14 Claims**



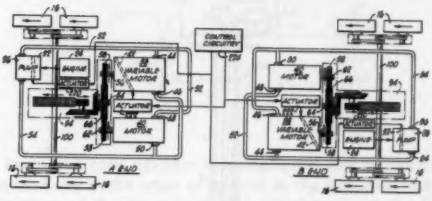
The chassis of a snowmobile is supported at either side thereof by endless tread assemblies which are connected to each other such that as one track assembly is raised, the other lowers and vice versa, thus allowing the chassis to remain vertical while traversing a slope or to permit the chassis to be leaned into a turn for better weight distribution or placement of the center of gravity of the vehicle and to incline the endless tread devices correspondingly inwardly with respect to the turn to obtain a better bite on the snow surface. The suspension mechanism also operates to couple the prime mover which is mounted on the chassis to the drive sprockets of the endless tread devices. Each track assembly includes an elongate frame mounting a drive sprocket at its rear end and an idler sprocket at its forward end, over which sprocket an endless tread member is trained and each further includes a forward extension projecting beyond the endless track member and which carries a ski at its forward extremity, the skis "feeling" the terrain ahead of the endless treads tending to "telegraph" variations in terrain to the tread assemblies while also accommodating for steering action of the vehicle.

3,637,036

HYDROSTATIC DRIVE SYSTEM

George W. Swisher, Jr., Oklahoma City; Don W. Smith, Edmond, and Ralph K. Snow, Jr., Oklahoma City, all of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed June 15, 1970, Ser. No. 46,129
Int. Cl. B60k *17/10*
U.S. Cl. 180—66 R **21 Claims**



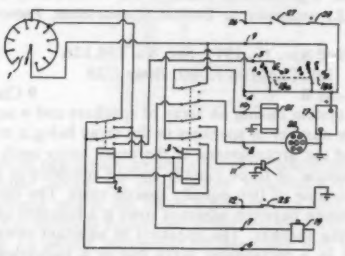
A drive system for a vehicle, particularly suited for use with highway construction equipment. The system employs a constant speed engine driving a variable displacement pump, and the pump, in turn, drives a variable displacement motor and a fixed displacement motor connected in parallel to the pump. The motors are connected in parallel to the drive wheel means of the vehicle. Controls are provided to operate the pump between zero and maximum displacement while the variable displacement motor is at maximum displacement, and to vary the displacement of the motor while the pump is at maximum displacement, such that the drive wheels of the vehicle are provided a maximum torque in the lower speed range where the hardest work is done by the vehicle, yet provide for higher speeds at reduced torque for traveling from one location to another. A dual drive system is also disclosed.

3,637,037

AUTO THEFT PROTECTION SYSTEM

George D. Doland; George J. Doland, and Charles M. Doland, all of 1602 Redway Lane, Houston, Tex.

Filed Nov. 24, 1969, Ser. No. 879,346
Int. Cl. B60r *25/04, 25/10*
U.S. Cl. 180—114 **6 Claims**



An automobile antitheft device which sounds an alarm and makes the automobile inoperative even when the automobile is "hot wired" or the ignition keys are available to the thief.

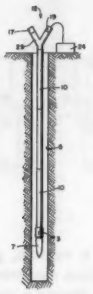
A multiposition ignition switch has a first terminal which completes a circuit to energize a first relay to enable normal starting and operation; and a number of other terminals which complete a circuit to energize a second relay which energizes an alarm and other circuits for making the automobile inoperative.

3,637,038

METHOD FOR RETRIEVING A LOST TOOL IN A BOREHOLE USING AN ACOUSTICAL WELL SOUNDER

Harley L. Tanner, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed July 24, 1970, Ser. No. 57,916
Int. Cl. G01v *1/00*
U.S. Cl. 181—0.5 **8 Claims**



A method is disclosed using an overshot retrieving device which is lowered into a borehole by means of tubing until the overshot arrives at a lost tool. An attempt is made to engage the tool with the overshot and after the attempt the overshot is raised a predetermined distance. An acoustical well sounder provides a soundwave in the tubing. When the overshot has successfully engaged the lost tool, the recorder of the well sounder provides a recording having a primary deflection in one sense in response to a reflection of the soundwave to indicate that the tool has been engaged. When the overshot has not engaged the tool, the reflection of the soundwave causes the recording to have a primary deflection in an opposite sense to indicate that the tool has not been engaged. An operator may then remove the overshot, the lost tool and tubing or repeat the engagement operation in accordance with the record provided by the recorder.

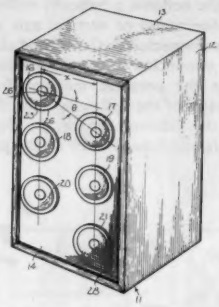
3,637,039

STEREO SPEAKER SYSTEM

Daniel Raichel, Wyckoff, and Chris G. De Vries, Jersey City, both of N.J., assignors to Dathar Corporation, Paterson, N.J.

Filed Apr. 19, 1971, Ser. No. 135,126
Int. Cl. G10k *13/00*; H04r *1/28*
U.S. Cl. 181—31 B **9 Claims**

A speaker system having an array of speakers and a sealed enclosure, the number of speakers in the array being a multiple of six and the arrangement of the array being such that there is a multiple of three equally spaced speakers in each row and a multiple of two equally spaced rows. The center-to-center distance between adjacent rows is a function of the diameter of the speaker. The speakers in adjacent rows are not arranged in a rectangular array but in a parallelogram array and the angle between the centerline through speakers in one row and the center of the most closely adjacent speaker in the next row being between 30° and 60°. If two such speaker systems are connected in a stereo system, they are arranged so that the placement of the speakers in one enclosure is a mirror image of the placement of the speakers in the other enclosure.

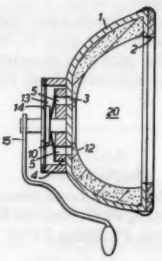


3,637,040

EAR DEFENDERS

Anthony Graham Gorman, Ruislip, England, assignor to Amplivox Limited

Filed July 22, 1969, Ser. No. 843,405
Claims priority, application Great Britain, Aug. 1, 1968, 36,842/68; June 4, 1969, 28,339/69
Int. Cl. G10k *11/04*; H04r *1/10*
U.S. Cl. 181—33 R **10 Claims**



An ear defender in which acoustic elements are added which in conjunction with the shunt capacitance provided by the volume enclosed by the shell thereof and the wearer's head constitute a low-pass or band-pass filter.

3,637,041

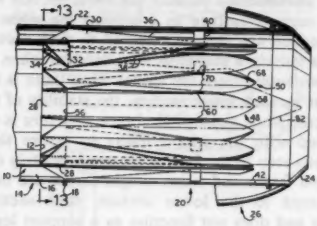
SOUND SUPPRESSION SYSTEM FOR FAN JET ENGINES

Jack H. Hilbig, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Sept. 2, 1970, Ser. No. 68,867
Int. Cl. B64d *33/06*; F01n *1/14*
U.S. Cl. 181—33 HC **10 Claims**

System is intended for use with a jet engine having an engine separator sleeve for discharging turbine exhaust gases, and an engine casing surrounding and spaced from the separator sleeve to form therewith an annular flow path for fan air rearwardly around the exhaust gas stream. A tail pipe is attached to and forms a continuation of the engine casing and defining a discharge zone to receive and control the turbine exhaust gas and fan airstreams. A series of partitions extend generally inwardly in alternately arranged pairs from the tailpipe in fore-and-aft planes to define a peripherally arranged series of flow passages for gas and air. A guide vane pivotally mounted in each passage has a stowed position

aligned with the separator sleeve to form a continuation thereof and segregate turbine exhaust gas and fan airflow. The vanes swing in unison, but in alternately opposite directions about transverse axes to cause their leading ends to swing radially in and out in alternation about the periphery so that one set of vanes directs fan air into the engine exhaust



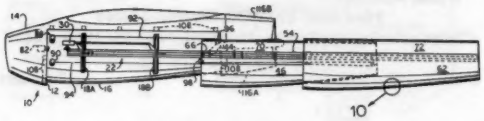
gas flow path, and the other set of alternately interposed vanes directs turbine exhaust gas into the fan airflow path. The result is a thorough intermixing of air and exhaust gas before leaving the engine nozzle, thereby reducing the temperature and velocity of the mixture and lowering the total jet noise.

3,637,042

METHOD AND APPARATUS FOR SUPPRESSING THE NOISE OF JET-PROPELLED AIRCRAFT

Burt F. Raynes, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed July 27, 1970, Ser. No. 58,387
Int. Cl. B64d *33/06;* **F01n** *1/08, 1/14*
U.S. Cl. 181—33 E **10 Claims**



A first shield of substantially hemicylindrical form is mounted on an engine nacelle of a jet-propelled aircraft so that the longitudinal axis thereof is substantially parallel with the longitudinal axis of the nacelle. The first shield is movable axially of the nacelle between a retracted position wherein it is alongside the latter and a deployed position wherein it is disposed under the jet stream discharged from the engine in the nacelle. A second shield is mounted on the outer side of the first shield and conforms therewith, this second shield being movable axially of the first shield so that it can also be positioned under the jet stream. Means are provided for moving the shields between their retracted and deployed positions. Each shield is preferably provided with rotatable panels which extend longitudinally along the upper portion of the sides thereof.

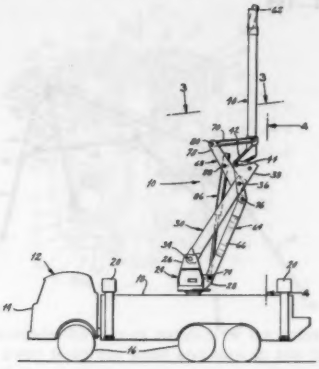
3,637,043

ARTICULATED AERIAL DEVICE

Daniel H. Zwight, and Roy Balogh, both of St. Louis County, Mo., assignors to McCabe-Powers Body Company, St. Louis, Mo.

Filed June 15, 1970, Ser. No. 46,223
Int. Cl. B66f *11/04*
U.S. Cl. 182—2 **25 Claims**

An articulated aerial device comprises a base and lower, middle and upper beams pivotally connected to one another, the lower beam being pivotally connected to the base. An upper linkage mechanism pivotally interconnects the upper and middle beams and a hydraulic cylinder is connected to the upper linkage for swinging the upper and middle beams with respect to one another. A Z-shaped linkage pivotally interconnects the base, the lower beam and the middle beam.



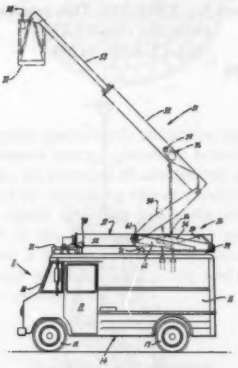
A lower hydraulic cylinder is connected at one of its ends to the base and at the other of its ends to the Z-shaped linkage. Extension of the lower hydraulic cylinder causes the lower beam to swing with respect to the base and simultaneously causes the middle beam to swing with respect to the lower beam.

3,637,044

LIFTING EQUIPMENT

Jay M. Eitel, Atherton, Calif., assignor to General Cable Corporation

Continuation of application Ser. No. 751,890, Aug. 12, 1968.
This application June 26, 1970, Ser. No. 56,071
Int. Cl. E04g *1/18*
U.S. Cl. 182—141 **11 Claims**



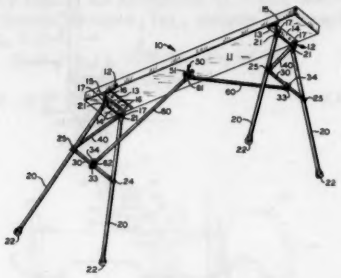
Lifting equipment having a boom structure which includes an outer boom, an inner boom mounted for telescoping movement within the outer boom and an arm, one end of which is pivotally connected to the rearward end of the outer boom to permit movement of the outer end of the boom structure about a substantially horizontal axis and the other end of which is pivotally mounted upon a support structure to permit movement of the first named end of the arm about a substantially horizontal axis.

3,637,045

KNOCKDOWN SAWHORSE

Donald E. Poffenbaugh, 581 Colima Drive, and Carl W. Piepmeier, 918 South Avenue, both of Toledo, Ohio, assignors to Said Poffenbaugh by said Piepmeier

Filed Apr. 29, 1970, Ser. No. 32,851
Int. Cl. E04g *1/32*; F16m *11/00*
U.S. Cl. 182—155 7 Claims



A pair of hinges and a pivot bracket which may be attached to a board to form a sawhorse, which hinges each have pivotally connected thereto a pair of divergent tubular legs and which bracket has pivotally connected thereto a pair of struts. Each pair of legs have detachably connected thereto a cross and a diagonal brace, and the struts are detachably connected to the cross braces. The outer ends of the legs may be extensible and/or may have rubber feet thereon. By disconnecting the struts the two pairs of legs may be collapsed against the board, and by disconnecting their cross braces, the legs of each pair may be further collapsed to further decrease the space required for storing the sawhorse when not in use.

3,637,046

FOLDABLE LADDER

George Harvey Emmons, 11 South 12th St., Marshalltown, Iowa

Continuation-in-part of application Ser. No. 847,099, Aug. 4, 1969, now Patent No. 3,540,549. This application July 23, 1970, Ser. No. 57,484
Int. Cl. E06c *1/383*
U.S. Cl. 182—170 17 Claims

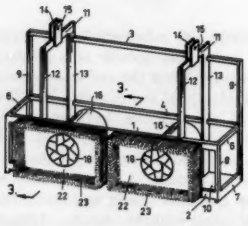
A step ladder structure having a foldable tripod supporting frame. The ladder component utilizes substantially parallel side pieces with connecting steps and with one of the legs of the tripod frame serving as one of the ladder side pieces. The other side piece has an upper and lower section hingedly attached in longitudinal alignment so that the lower section is capable of a slight misalignment with the upper section. The lower section is normally capable of engaging a level support surface to serve as a support leg when weight forces are on any step attached thereto and on a slightly unlevel surface, the hinged construction permits the lower section to also engage such support surface as a support leg when weight is concentrated on any steps connected to such section. However, this is merely a matter of convenience when mounting on and dismounting from the ladder for if there is no ground engagement by such lower section, the stability of the ladder is not affected since appropriate brace structure is operatively associated with the tripod frame to assure that weight forces on any step of the ladder are appropriately distributed to the tripod frame and when weight forces are on any step not connected to the lower section, such section is not required to and does not function as a support leg irrespective of whether it may be in contact with the ground support. This ladder includes adjustable brace structure for securely holding it in selective positions of partially extended position so that it may be utilized in confined areas. This ladder also includes a removable standard to steady a person standing on the top plate and such standard may be employed to contain an umbrella as a shield from the sun. A removable seat and a removable foot rest are provided relative to the top plate for the convenience of the user under different circumstances. Detachable bearing feet are provided to make the ladder usable efficiently in soft or muddy ground and to also maintain the ladder component in an appropriate vertical plane when the ladder may be used on uneven or unlevel ground.

3,637,047

STABILIZED PLATFORM FOR WINDOW CLEANING AND LIKE USES

Eric William Cox, 2 McLachlan Ave., Artarmon, New South Wales, Australia

Filed Mar. 12, 1970, Ser. No. 19,046
Claims priority, application Australia, Mar. 25, 1969, 52419
Int. Cl. F04g *3/10*
U.S. Cl. 182—222 9 Claims



A suspendible platform comprising a frame with a decking, means on the frame for urging the frame towards a surface to be traversed by the platform and surface-engaging means on the frame.

3,637,048

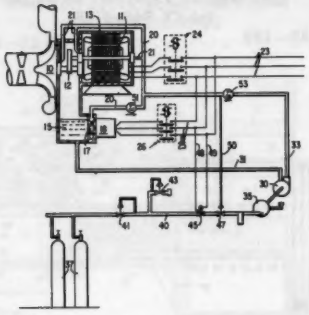
AUXILIARY LUBRICATING SYSTEM

Gordon L. Mount, West Monroe, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 22, 1969, Ser. No. 859,935
Int. Cl. F16n *29/02*
U.S. Cl. 184—6.1 4 Claims

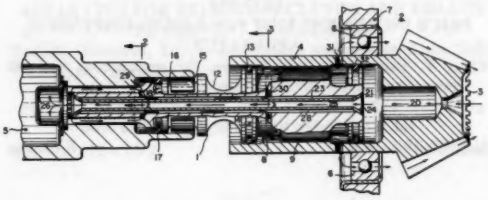
The lubricating system includes an auxiliary oil pump, powered by an auxiliary power supply for supplying oil under pressure to a machine having a large, heavy rotating part,

such as an impeller, which has a coast down period of substantial length upon interruption of the operating power to



the machine. The system is so rigged that the auxiliary pump is not powered unless the machine was in operation at the time of the power interruption.

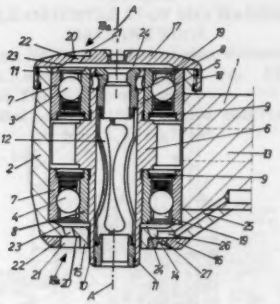
3,637,049
CONTINUOUS, SELF-PUMPING LUBRICATIONS SYSTEM FOR SPLINED SHAFTS
John L. Butterfield, and George E. Brissey, both of Erie, Pa., assignors to General Electric Company
Filed Mar. 3, 1970, Ser. No. 16,009
Int. Cl. F16n *7/36*
U.S. Cl. 184—6.12 **8 Claims**



A lubrication system for a splined shaft is described in which rotation of the shaft produces a continuous pumping action of the lubricant through the splines. A central bore is formed in the stub shaft. A hollow tube of smaller diameter than the bore is positioned in the bore forming an annular passage between the tube and the shaft bore. Radial holes at opposite ends of the shaft communicate between the exterior of the shaft and the annulus to provide a return path for the oil. Rotation of the shaft and the radial holes produce a pumping action which pumps the lubricant through the tube and the splines and back into the annular return passage and out the other radial hole to produce continuous pumping of the oil through the shaft splines.

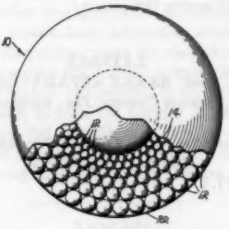
3,637,050
DENTAL ANGLE HANDPIECE HEAD
Erich Hoffmeister, Biberach/Riss, Germany, assignor to Kaltenbach & Voigt, Bismarckring, Germany
Filed Mar. 11, 1970, Ser. No. 18,594
Claims priority, application Germany, July 11, 1969, P 19 35 342.5
Int. Cl. A61c *1/10*; F16n *1/00*
U.S. Cl. 184—6 R **4 Claims**

A dental angle handpiece head has a rotor shaft mounted in ball bearings which are lubricated through respective holes at opposite ends of the head, the holes opening externally and leading to annular spaces between the inner and outer races of the bearings. The holes have two portions of different diameter to form a step therebetween the outer hole portion being of larger diameter. The inner hole portion is



inclined towards the axis of rotation of the rotor shaft in a direction away from the head and also in the direction of rotation of the shaft from the outside to the inside of the housing.

3,637,051
IMPACT ENERGY ABSORBING SYSTEM UTILIZING FRACTURABLE MATERIAL
T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Earl R. Collins, Jr., LaCanada, Calif.
Filed Sept. 15, 1969, Ser. No. 857,967
Int. Cl. F16d *63/00*
U.S. Cl. 188—1 B **8 Claims**



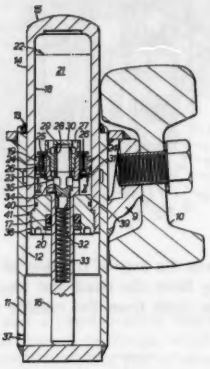
A shock absorber particularly suited for use as a protective barrier in an impact energy absorbing system, characterized by the utilization of a myriad of contiguous spheres arranged in multiple strata for absorbing forces developed on impact, a feature of the shock absorber being the employment of a brittle material in the fabrication of the spheres, whereby payload rebound is inhibited and impact force dissipation is enhanced through a sequential fracture and collapse of successive strata of spheres.

3,637,052
WAGON RETARDERS
David Ewart Bick, Cheltenham, England, assignor to Dowty Mining Equipment Limited, Ashchurch, Tewkesbury, England
Filed Aug. 20, 1970, Ser. No. 65,381
Claims priority, application Great Britain, Sept. 12, 1969, 45,107/69
Int. Cl. B61k *7/02*
U.S. Cl. 188—62 **9 Claims**

A wagon retarder for installation on a railway track has a telescopic cylinder and piston device containing hydraulic

fluid and compressed gas, said device being contracted by an approaching wheel and then being extended by the compressed gas as the wheel moves away. The cylinder slides in a fixed guide cylinder, and it slides on the piston which has a piston rod of smaller diameter extending through a sealing device into engagement with the base of the guide cylinder.

The piston carries a flow-sensitive valve which is closable



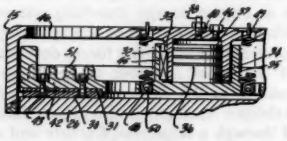
during contraction of the device whereby hydraulic fluid flows from one side of the piston to the other side through a pressure relief valve. The relief valve generates a pressure which acts on the cylinder to exert a retarding force against the wagon wheel. During extension of the device, the flow-sensitive valve opens to enable hydraulic fluid to flow in the reverse direction across the piston.

3,637,053

DISC BRAKE APPARATUS

Elmo N. Boyles, Orange County, Fla., assignor to Disco Industries, Inc.

Filed Mar. 30, 1970, Ser. No. 23,808
Int. Cl. F16d *55/228*
U.S. Cl. 188—71.1 **12 Claims**



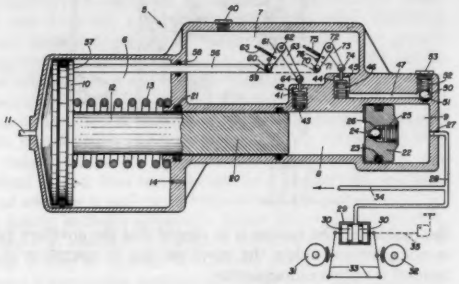
A vehicle brake apparatus for attachment to the axle of a vehicle, has rotatable disc attached so as to rotate with the wheel of a vehicle and having free-floating pistons adapted to slide in cylinder bores of cylinders attached to the axle of the vehicle, and a telescoping brakeshoe actuated in one direction by the free-floating pistons whereby pneumatic or hydraulic pressure on the cylinder will move the piston telescoping the brakeshoe and brake lining into frictional engagement with the disc. The telescoping brakeshoe has bearings to maintain the telescoping portion in alignment and may have segmented portions for cooling and a spring return.

3,637,054

PNEUMATIC-HYDRAULIC BRAKING SYSTEM FOR RAILWAY CARS

Henry R. Billeter, Deerfield, Ill., assignor to Sloan Valve Company, Chicago, Ill.

Filed Mar. 23, 1970, Ser. No. 21,769
Int. Cl. B60t *8/18*
U.S. Cl. 188—195 **24 Claims**



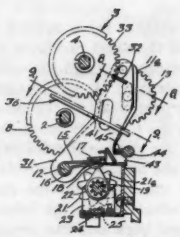
In this braking system the airbrake cylinder on the railroad car actuates a master hydraulic cylinder connected to hydraulic-operated truck cylinders to operate the wheel brakes. Provisions are made for replenishing the hydraulic fluid in the system and an automatic hydraulic slack adjuster together with an empty and load-compensating arrangement is included in one unitary structure.

3,637,055

PRICE INCREMENT UNIT FOR LIQUID-DISPENSING APPARATUS

Einar T. Young, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed July 10, 1970, Ser. No. 53,888
Int. Cl. F16d *67/00*; F16h *3/34*; B67d *5/06*
U.S. Cl. 192—4 R **8 Claims**



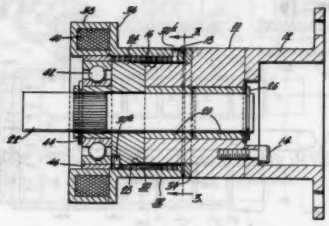
The price increment unit used in a multigrade liquid fuel-dispensing apparatus comprises a selective gearing arrangement which causes a driven or output shaft to be driven at various preselected speeds less than or greater than the speed of the driving or input shaft, one such preselected speed for each respective grade of liquid fuel being dispensed, above the pricing base grade. When the pricing base grade is selected for dispensing, the output shaft of the unit is locked against rotation. Means are provided for causing a locking of this output shaft to occur also when a different grade of fuel is selected for dispensing, thereby to establish the price of this different grade at the same number of cents per gallon as the pricing base grade.

3,637,056

SELECTIVELY DISENGAGEABLE HELICAL SPRING CLUTCH

John S. Baer, Medford Lakes, N.J., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed July 22, 1970, Ser. No. 57,044
Int. Cl. F16d 67/02
U.S. Cl. 192—12 BA 10 Claims



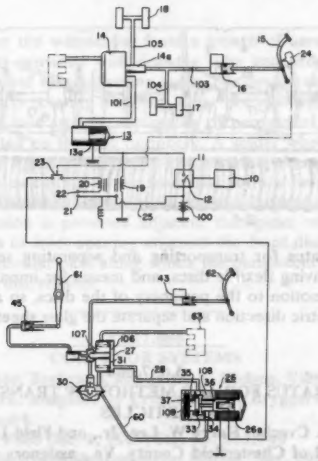
A helical clutch spring is attached one end to the output hub and at its other end to a collar and lies opposite a cylindrical clutch surface of an input hub. The clutch spring tends to be normally out of engagement with the clutch surface. However, by virtue of resilient means urging a surface on the collar into an opposed surface on the input hub, the rotation imparted to the collar causes the spring to engage the input hub and drive the output hub through the spring. Actuator means may be selectively caused to act upon the collar to draw it in opposition to the resilient means away from the input hub and allow the spring to return to its normal position and the clutch to disengage.

3,637,057

APPARATUS FOR RELEASING CLUTCH AND BRAKES TO PREVENT WHEEL SKID

Tosiaki Okamoto, Toyota-shi, Japan, assignor to Aisin Seiki Company Limited, Toyota-shi, Japan

Filed Oct. 21, 1969, Ser. No. 868,141
Claims priority, application Japan, Oct. 22, 1968, 43/76574
Int. Cl. F16d 67/04
U.S. Cl. 192—13 R 6 Claims



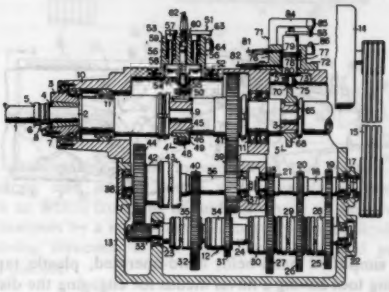
A vehicle having a conventional clutch pedal and brake pedal is provided with an antiskid brake system wherein a wheel rotation sensor provides a signal for the automatic release and reapplication of the brakes during a substantial wheel lock condition. Upon the initial reception of the signal, the clutch will automatically be released and will be maintained in the release position during any subsequent automatic release and reapplication of the brakes during a continuous single operation of the brake pedal.

3,637,058

SPINDLE-ORIENTED STOP MECHANISM FOR MACHINE TOOL

Yoshikazu Sato, No. 1026, Shimotakaido, 4-chome, Suginami-ku, Tokyo, and Masaru Tanaka, No. 2211, Okura, Machida-shi, Tokyo, both of Japan

Filed Sept. 24, 1969, Ser. No. 860,716
Int. Cl. F16d 71/00
U.S. Cl. 192—146 6 Claims



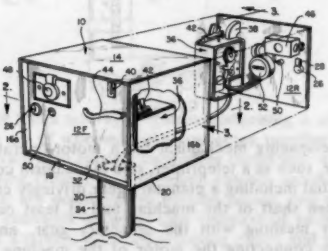
A stop mechanism for stopping the spindle of a machine tool in a preselected position. The drive mechanism for the spindle is deenergized by a signal from a tape-operated controller and the inertia of the drive system is permitted to drive the spindle till the energy of the system is dissipated. A second signal from the controller operates a system of electromagnetic clutches and gear trains to slowly drive the spindle till a sensing device feels a selected position of the spindle. The device then deenergizes the slow drive and the inertia of the system moves the spindle toward the selected position. A stop mechanism is operated to stop the slowly coasting mechanism and to lock the spindle in the selected position. In the event the spindle does not reach the selected position, the slow drive is again energized and the process of driving and coasting repeated till the position is secured.

3,637,059

COIN-OPERATED ELECTRIC POWER SUPPLY STATION

Robert L. Schmidt, Fort Collins, Colo., assignor to Travelers Electric, Inc., Fort Collins, Colo.

Filed Apr. 20, 1970, Ser. No. 30,020
Int. Cl. G07f 5/10
U.S. Cl. 194—9 T 4 Claims



A coin-operated electric power supply station especially adapted for use in remote unsupervised locations. The station

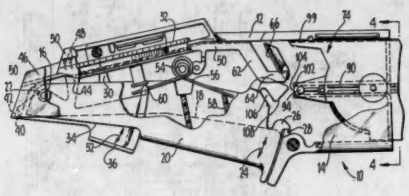
includes a substantially vandalproof metal box having one or more removable walls which are positively locked in place by a key-operated lock. The control elements of the station are mounted on the interior side of the removable wall so as to be readily accessible for repair. When the box is closed, only an actuating handle, a coin slot and an electric power outlet are accessible from the exterior of the box.

3,637,060

EMBOSSING TOOL WITH SELF LOADING TAPE FEED MECHANISM

John McMahon, Livermore, Calif., assignor to Dymo Industries, Inc., Emeryville, Calif.

Filed Nov. 10, 1969, Ser. No. 875,467
Int. Cl. B41j *1/30*
U.S. Cl. 197—6.7 13 Claims



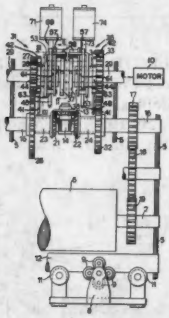
A simplified hand-held, hand-operated, plastic tape embossing tool having a novel means for engaging the distal end of a coil of tape disposed in a cartridge or magazine and for feeding the same to and through a tape embossing station, without the necessity of manually feeding such tape end through the normal tape feed rolls.

3,637,061

LINE-SPACING MECHANISM FOR A TELEPRINTER OR SIMILAR PRINTING MACHINE

Alessandro Cortona, and Pietro Musso, both of Turin, Italy, assignors to Ing. C. Olivetti & C.S.p.A., Ivrea, (Turin), Italy

Filed Nov. 8, 1968, Ser. No. 774,375
Claims priority, application Italy, Nov. 16, 1967, 53754 A/67
Int. Cl. B41j *19/76*
U.S. Cl. 197—114 R 6 Claims



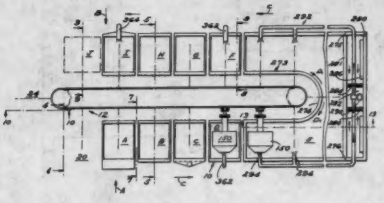
A line-spacing mechanism for a motor-operated printing machine, such as a teleprinter, said mechanism comprising, a differential including a planetary gear drivingly connected to the platen shaft of the machine and at least one sun gear drivingly meshing with the planetary gear, and a clutch drivingly connecting the motor of the machine to the sun gear for imparting rotation thereto, so that the platen of the machine will be rotated in response to selective engagement of the clutch.

3,637,062

BARREL-TYPE PROCESSING APPARATUS

James Barton, Gross Pointe Woods, and Patrick H. Norton, Birmingham, both of Mich., assignors to Ionic International Inc., Warren, Mich.

Original application July 27, 1966, Ser. No. 568,287, now Patent No. 3,521,650, dated July 28, 1970. Divided and this application Oct. 1, 1969, Ser. No. 870,707
Int. Cl. B05c *3/00*; B23g *5/22*
U.S. Cl. 198—19 10 Claims



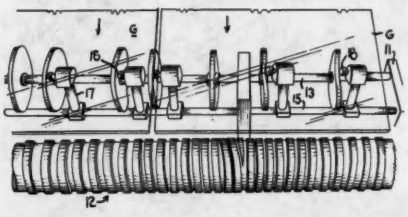
A plurality of barrels transported on a horizontal frame have entrance openings facing outwardly of the frame to facilitate the loading and unloading thereof and overall processing operations. Each barrel is in the form of a hollow perforated receptacle of octagonal top and sidewall configuration, closed at its inner end or bottom, and with the polygonal outer walls of its top converging toward the barrel axis. Each barrel is mounted on the frame of the machine by a lift arm, the lift arm and barrel assembly having a generally horizontal position or attitude when at a treating station and at the loading station, and an inclined transfer attitude, with the entrance opening of the barrel facing upwardly, when the barrel is moved from station to station. The assembly has an inclined downwardly extending attitude when at the unloading station.

3,637,063

APPARATUS FOR SEPARATING GLASS SHEETS

Cecil R. Ward, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 10, 1969, Ser. No. 840,629
Int. Cl. B65g *47/22*
U.S. Cl. 198—29 4 Claims



Apparatus for transporting and separating severed glass sheets having flexible discs, and means for imparting an eccentric motion to the periphery of the discs, so as to impart an eccentric direction and separate the glass sheets.

3,637,064

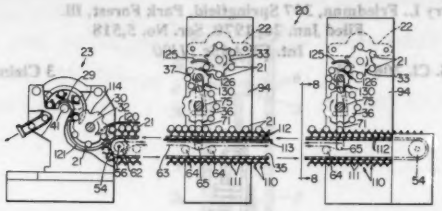
APPARATUS FOR AND METHOD OF TRANSFERRING ARTICLES

Daniel S. Cvacho; Harry W. Lee, Jr., and Field I. Robertson, Jr., all of Chesterfield County, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 23, 1969, Ser. No. 827,380
Int. Cl. B65g *47/30*
U.S. Cl. 198—32 30 Claims

An apparatus for and method of transferring articles, such as cylindrical cans, from a plurality of can forming devices to

a high speed can trimming machine whereby cans are transferred in a positive and efficient manner and shutdown of



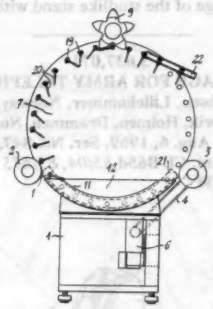
one or more of the plurality of can forming devices will not require stopping of the can trimming machine.

3,637,065

MAGNETIC DISC ORIENTOR FOR AEROSOL VALVES

Tomaso Ruscitti, Milano, Italy, assignor to Coster Tecnologie Speciali S.p.A., Milan, Italy

Filed June 18, 1970, Ser. No. 47,432
Claims priority, application Italy, June 28, 1969, 18891 A/69
Int. Cl. B65g *17/46, 47/24*
U.S. Cl. 198—33 **5 Claims**



Device for the withdrawal from a trough of aerosol container valves provided with drawing tube and orderly conveyance thereof to a collecting guide, the device comprising a trough and a rotating disc, the lower portion of which extends within said trough, a plurality of permanent magnets being mounted on the disc periphery. A spider wheel is provided at the top portion of the disc, rotating therewith and having teeth extending on the front disc surface between the magnets on which the teeth never overlie. A fixed guide for valve collection is provided adjacent the spider wheel and has a mouth or inlet opening adjacent the front disc surface and at the circular path along which the permanent magnets move as the disc rotates.

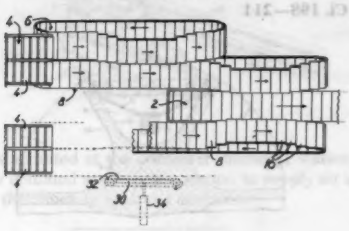
3,637,066

CONVEYOR SYSTEMS

Arne S. Idskov, Brabrand, and Jacob A. Nielsen, Viby J., both of Denmark, assignors to Crisplant A/S, Bryggervej, Risskov, Denmark

Filed Dec. 1, 1969, Ser. No. 881,146
Claims priority, application Great Britain, Nov. 29, 1968, 56,746/68
Int. Cl. B65g *47/34*
U.S. Cl. 198—38 **9 Claims**

A conveyor system primarily for use in automatic sorting systems in which it is desired to transfer articles from a number of feeding stations to a common sorting conveyor with a well-defined transfer time, said conveyor system comprising at least a first and a second conveyor, a partial length of said first conveyor extending closely along a partial length of said second conveyor substantially parallely therewith, said conveyors being driven at equal velocities, and transfer



means participating in the movement of the conveyors at least along said partial length and operable to laterally deplace an article from one of said conveyors to the other of said conveyors by a movement substantially perpendicular to the moving direction of the conveyors along said partial lengths thereof.

ERRATA

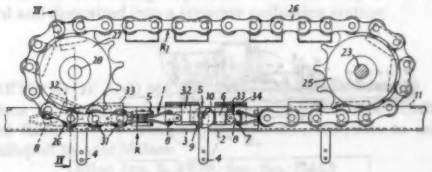
For Classes 197—184 see:
Patent Nos. 3,637,090 and 3,637,091

3,637,067

CONVEYOR SYSTEMS

Eric L. Wright, Oadby, England, assignor to Hytrac Conveyors Limited, Leicester, England

Filed Dec. 23, 1969, Ser. No. 887,622
Claims priority, application Great Britain, Dec. 31, 1968, 61,853/68
Int. Cl. B65g *23/00*
U.S. Cl. 198—203 **7 Claims**



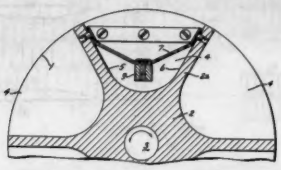
Drive unit for a conveyor system comprising a conveyor chain made up of wheeled links connected together end to end and having load carriers depending therefrom. A pair of endless driving chains, each of which extends around a pair of sprockets, are positioned in parallel planes, one on each side of the conveyor element. One sprocket of each pair is driven from a motor, via a self-adjusting pulley and an overload clutch. U-shaped carriers are secured between the driving chains and carry drive dogs arranged to engage from above and drive the conveyor chain when the driving chains are travelling parallel to the conveyor chain.

3,637,068

ROTARY CONVEYOR

Walter Eckstein, and Ferdinand Gah, both of Munich, Germany, assignors to Metzeler Aktiengesellschaft, Munich, Germany

Filed Mar. 10, 1970, Ser. No. 22,741
Claims priority, application Germany, Mar. 13, 1969, P 19 12 858.6
Int. Cl. B65g *29/00*
U.S. Cl. 198—211 6 Claims



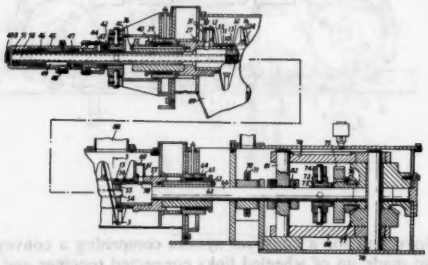
A rotary wheel has a hub mounted for rotation about an axis and a plurality of circumferentially distributed wall portions which extend from the hub at least substantially radially of the axis and defining a plurality of cells each having a radially outwardly directed opening. A bag is mounted in each of the cells, consisting of elastomeric material, and has an open side facing the associated opening so that material which is introduced into the bag through the opening when the latter faces substantially upwardly with reference to the substantially horizontal axis of rotation, the material will issue from the open side and through the opening when the wheel has been displaced to a position where the opening faces downwardly.

3,637,069

SCREW CONVEYOR APPARATUS

Joseph D. Christian, deceased, late of San Francisco, Calif.; Marcella B. Christian, executrix, and Robert F. Christian, executor, both of San Francisco, Calif., assignors to Packaged Power Terminals Inc., San Francisco, Calif.

Filed May 12, 1969, Ser. No. 823,999
Claims priority, application Great Britain, May 21, 1968, 24,127/68
Int. Cl. B65g *33/00*
U.S. Cl. 198—213 3 Claims



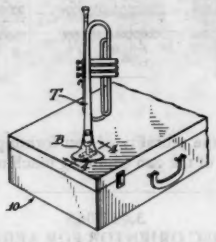
The invention relates to a screw conveyor apparatus having a support shaft and a screw disposed helically around the support shaft and attached to the shaft at its ends, said screw being spaced from the shaft by a series of lugs that are attached to the screw and are slidable on the shaft and are spaced apart from each other to leave spaces between the screw and the shaft.

3,637,070

COMBINATION CARRYING CASE AND STAND FOR TRUMPET

Perry L. Friedman, 307 Springfield, Park Forest, Ill.

Filed Jan. 26, 1970, Ser. No. 5,518
Int. Cl. A45c *11/00*
U.S. Cl. 206—13 3 Claims



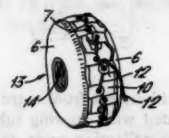
An improved carrying case and stand for a belled music instrument is provided by securing an attachment member to the lid of the case to which a studlike stand may be selectively secured to convert the case into a very stable base for the stand. A duplicate attachment on the opposite side of the lid provides for storage of the studlike stand within the case.

3,637,071

CABLE PACKAGE FOR ARMY TELEPHONE CABLE

Arnulv Moe Jacobsen, Lillehammer, Norway, assignor to A/S Norsk Kabelfabrik, Holmen, Drammen, Norway

Filed Aug. 6, 1969, Ser. No. 847,838
Int. Cl. B65d *85/04, 85/675*
U.S. Cl. 206—52 W 1 Claim



The specification discloses a cable package or dispenser for army telephone cable, comprising a cable coil with a hollow center, two annular side members of strong, flexible material and a belt of strong, flexible material overlying the outer periphery of the coil. Holes are provided at the outer periphery of the side members, which are kept tightly together by a lacing extending through the holes and overlying the belt.

3,637,072

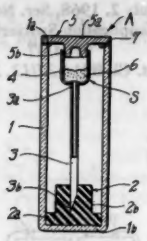
DEVICE FOR PRESERVING DRUGS FOR INJECTION

Shozo Narusawa, and Noritoshi Iizuka, both of Tokyo, Japan, assignors to Yurin Tokushu Kogyo Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1970, Ser. No. 191
Claims priority, application Japan, Jan. 9, 1969, 44/1840
Int. Cl. B65d *85/54;* A61l *5/32*
U.S. Cl. 206—63.2 R 8 Claims

A drug preservation container unit for use in connection with injection. It comprises a vertically elongated casing sealed with a cap and a needle assembly held in an upright position within said casing, said needle assembly containing a

freeze-drying processed drug for use in injection and arranged to be connected to a syringe. The unit contains such



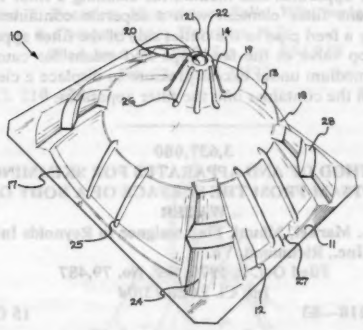
drug in such a small quantity as to be conveniently dispensed to a small number of persons.

3,637,073

SEPARATOR FOR GLASS ARTICLES

Charles H. Capuano, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Oct. 6, 1969, Ser. No. 864,114
Int. Cl. B65d *71/00, 85/00, 21/00*
U.S. Cl. 206—65 K **5 Claims**



A plastic-shipping container and separator for an assortment of pieces of glassware of different shapes and sizes. The separator has a conical body for the various ranges of ware sizes. Diagonally spaced support ridges reinforce the body portion of the separator and hold the glassware in spaced relationship to the separator. An annular orifice at the top of the separator permits hot gases entrapped within the conical portion of the glass to escape.

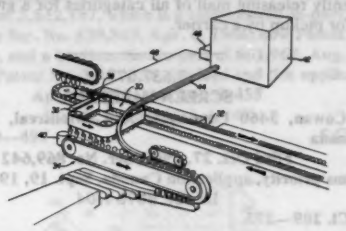
3,637,074

CONTAINER HANDLING APPARATUS

John D. Banyas, Toledo, and Frederick L. Wallington, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc.

Filed Mar. 31, 1970, Ser. No. 24,173
Int. Cl. B07c *5/04*
U.S. Cl. 209—74 **7 Claims**

Apparatus for handling and transferring bulb-shaped glass containers from one station in a container production line to another. A series of container handling vacuum chucks are linked together into an endless chain to pick glass containers in succession up from a first conveyor, to carry the containers through an inspection station, a coating tunnel and past a reject station and to then deposit the containers on a second conveyor. A control valve mounted on each chuck normally supplies the chuck with vacuum, however the con-



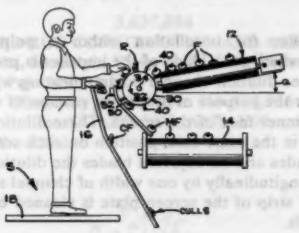
trol valve is actuated at the container discharge station, and may also be actuated at the reject station to supply air under pressure to the chuck to eject the container.

3,637,075

OBJECT SORTING WITH A SCANNING REEL

David W. Cayton, Cupertino, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 21, 1970, Ser. No. 39,199
Int. Cl. B07c *7/00*
U.S. Cl. 209—122 **29 Claims**



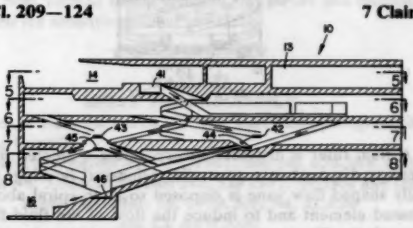
Objects such as fruit, tomatoes or the like are manually sorted from a plurality of sorting stations disposed in front of a rotating, open-faced scanning reel. The reel has longitudinal, radially projecting flights that are fed from the top by a laterally inclined longitudinally running belt conveyor. Successive rows of the objects are inspected and selected objects are manually flicked out over the upper quadrant of the reel, whereas the remaining objects are confined by a curved guard and deposited into a separate collection station.

3,637,076

METHOD OF AND MEANS FOR PROCESSING MAIL

William E. Halopoff, 357 Los Pinos Way, San Jose, Calif., and Robert M. Wilson, Hayward, Calif., assignors to said Halopoff by said Wilson

Filed Jan. 8, 1970, Ser. No. 1,463
Int. Cl. B07c *7/00*
U.S. Cl. 209—124 **7 Claims**



A method of processing mail is disclosed in which the mail is separated into categories by physical characteristics for

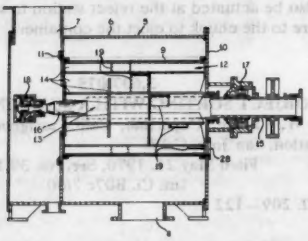
processing regardless of the class thereof. A facility particularly adapted for processing mail in categories by physical characteristics is described including means for transporting, sorting and storing mail in each of such categories and subsequently releasing mail of all categories for a given destination for pickup by a carrier.

3,637,077

SCREEN IMPELLER

Ben Cowan, 5460 Connaught Ave., Montreal, 29 Quebec, Canada

Filed Oct. 27, 1969, Ser. No. 869,642
Claims priority, application Canada, Sept. 19, 1969, 62,526
Int. Cl. B07b *1/04*
U.S. Cl. 209—273 **7 Claims**



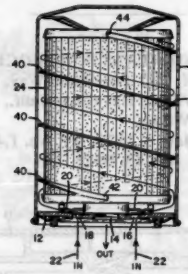
An impeller for installation within a pulp screening machine in which each blade of the impeller is provided with a white water dilution channel communicating with the hollow shaft for the purpose of projecting streams of white water against the inner face of the screen. These dilution channels are located in the same axial position on each set of radially opposite blades and on adjacent blades the dilution channels are offset longitudinally by one width of channel so that each longitudinal strip of the screen plate is cleaned by two dilution channels.

3,637,078

DIRECTIONAL FLOW FLUID FILTER

Bartley Douglass Hollar, Longmont, Colo., assignor to Gould Inc., Mendota Heights, Minn.

Filed June 22, 1970, Ser. No. 48,325
Int. Cl. B01d *27/06*
U.S. Cl. 210—73 **16 Claims**



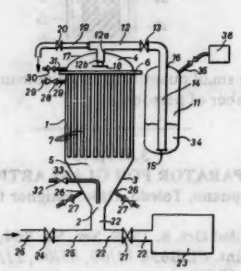
A fluid filter is disclosed incorporating a pleated filtering element disposed in a generally cylindrical housing. a helically shaped flow vane is disposed so as to spiral about the pleated element and to induce the flow of the fluid flowing through the filter to travel generally across the pleats rather than along the pleats, thus directing the flow over a larger percentage of the total area of the filtering medium.

3,637,079

FILTER AND METHOD OF CLEANING THE FILTER

Fritz Strub, St. Gallen, Switzerland, assignor to Filtrox-Maschinenbau AG.

Filed July 2, 1968, Ser. No. 742,047
Claims priority, application Switzerland, July 12, 1967, 9964/67
Int. Cl. B01d *27/12, 29/32*
U.S. Cl. 210—82 **10 Claims**



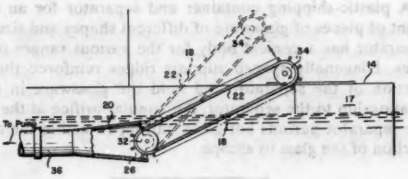
A filter apparatus and method for cleaning a filter having at least one filter element with a separate container connected by a feed pipe to the outlet side of the filter apparatus and a stop valve in the feed pipe and means for causing a gaseous medium under excess pressure to displace a cleaning fluid from the container into the filter apparatus.

3,637,080

METHOD OF AND APPARATUS FOR SKIMMING FLOTSAM FROM THE SURFACE OF A BODY OF WATER

Arthur L. Markel, Miami, Fla., assignor to Reynolds International, Inc., Richmond, Va.

Filed Oct. 9, 1970, Ser. No. 79,487
Int. Cl. E02b *15/04*
U.S. Cl. 210—83 **15 Claims**



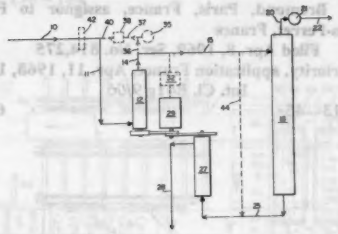
A method of and apparatus for skimming flotsam from the surface of a body of water. Floating material, such as oil, is directed toward and into pockets on a continuously driven conveyor belt means which serves to submerge the floating material beneath the surface of the water. A transfer of the material is made to a suitable conduit means from which the floating material is pumped to a suitable reservoir or station where it is separated from the water. When the skimmer is used to harvest plants or the like, a cutting means is placed in the entrance of the conduit to shred the plants.

3,637,081

LIQUID TREATMENT SYSTEM

William E. Bradley, New Hope, Pa., assignor to Puredesal, Inc., Levittown, Pa.

Filed Apr. 9, 1970, Ser. No. 27,049
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—110 11 Claims



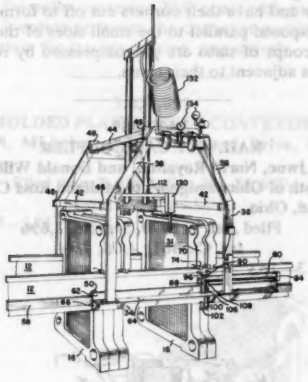
A liquid treatment system, involving pressure exchange pumps for positive control of reverse osmosis liquid purification, which overcomes corrosion and supersaturation problems.

3,637,082

PLATE SHIFTER AND SCRAPER ASSEMBLY FOR FILTER PRESSES

Leonard T. Bentzien, Menomonee Falls, Wis., assignor to T. Shriver & Company, Inc., Harrison, N.J.

Filed June 20, 1969, Ser. No. 834,948
Int. Cl. B01d *25/32*
U.S. Cl. 210—225 11 Claims



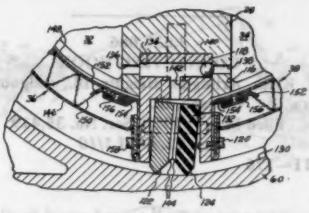
A system for mechanically shifting and cleaning the filter plates in a pressure-type filter press wherein the filter plates, which are supported on the side rails of the filter press and have supporting brackets extending over each of the rails, are shifted apart to allow a plate scraping mechanism to move downwardly against the plates and scrape the accumulated filter cake from the filter plates. The plate shifter and scraper are mounted on a carriage which slides along the rails of the filter press and the plate shifter includes pneumatically operated plate shifting devices to separate the filter plates. Once the plates are separated, a scraper mounted on the carriage in pendulum fashion above the plates is extended between the separated plates to scrape the accumulated filter cake from the exposed faces of the filter plates.

3,637,083

FLUID SYSTEM WITH SELF-CLEANING FILTER

Nils O. Rosaen, 3774 Quarton Road, Bloomfield Hills, Mich.

Original application Mar. 14, 1968, Ser. No. 713,018, now Patent No. 3,542,197, which is a continuation-in-part of application Ser. No. 539,863, Apr. 4, 1966, now Patent No. 3,425,557, and a continuation-in-part of 661,968, Aug. 21, 1967, now Patent No. 3,425,558. Divided and this application Apr. 1, 1970, Ser. No. 31,455
Int. Cl. B01d *35/02, 33/40*
U.S. Cl. 210—497 5 Claims



A partially cylindrical filter element for use in two chambers, at different pressures, and separated by a partition having pressure-responsive vanes.

3,637,084

HANGER ROD CONSTRUCTION AND ASSEMBLY

Mark O. Uitz, Mountain View, Calif., assignor to F.J.L. Corporation, Palo Alto, Calif.

Filed May 8, 1969, Ser. No. 822,956
Int. Cl. A47f *5/08*; A47h *1/02*
U.S. Cl. 211—105.1 20 Claims

Hanger rod construction and assemblies including a cylindrical rod with longitudinally extending undercut slots formed in its outer surface and mounting brackets and hanger devices for mounting in said slots, together with an internal bore formed in the rod and end pieces and mounting brackets for mounting in said bore.

3,637,085

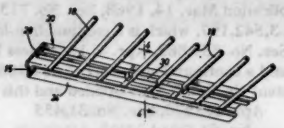
SHELF TRIM ASSEMBLY

Charles A. Ball, Suite 510, 80 The East Mall, Islington, Ontario, Canada

Original application Apr. 20, 1967, Ser. No. 632,355, now Patent No. 3,554,383, dated Jan. 12, 1971. Divided and this application Mar. 26, 1970, Ser. No. 22,824
Int. Cl. A47f *5/00*
U.S. Cl. 211—153 2 Claims

Clip means for holding a trim plate on a metal shelf structure with a frame and spaced transverse bars thereon. One

type of clip means engages the trim plate and at least one of the transverse bars. The other type of clip means which is



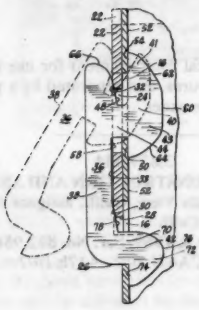
made of a resilient strip of steel engages the trim plate and the frame.

3,637,086

CONNECTING HOOK

Herbert H. Klein, Arlington Heights, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed May 7, 1970, Ser. No. 35,419
Int. Cl. A47f 5/10
U.S. Cl. 211—176 5 Claims



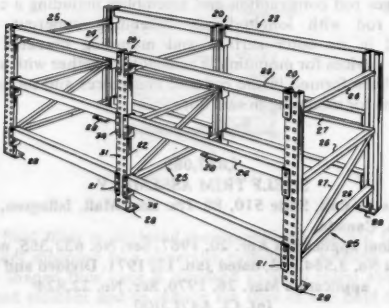
A connecting hook for knockdown racks that have hollow upright posts to which horizontal supporting members are connected through a connecting plate. An opening in the connecting plate is aligned with an opening in the vertical post and the connecting hook is swung into the opening from the outside of the post to lock the connector plate in positional engagement with the upright post.

3,637,087

JOINT STRUCTURE

Denny A. Denny, Dallas, Tex., assignor to Midland Machine Corporation, Elizabeth, N.J.

Filed Oct. 30, 1967, Ser. No. 678,819
Int. Cl. A47f 5/10
U.S. Cl. 211—176 23 Claims



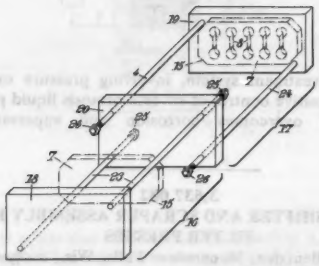
A joint structure between a supported member and a supporting member including a tongue on one of the members, a tongue-receiving slot in the other of the members, lateral complementary mating load bearing surfaces on the tongue and along an edge of the slot, and a removable locking retainer engageable with the members for holding them against disengagement from each other.

3,637,088

COUPLING SYSTEM FOR VEHICLES IN PARTICULAR RAILWAY VEHICLES

Genevieve Bremond, Paris, France, assignor to Paulstra, Levallois-Perret, France

Filed Apr. 8, 1969, Ser. No. 814,275
Claims priority, application France, Apr. 11, 1968, 147838
Int. Cl. B61g 9/06
U.S. Cl. 213—45 6 Claims



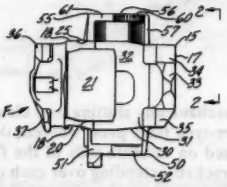
The coupling comprises two groups of rubber slabs which transmit the traction force and the buffering force to the chassis of the vehicle, both these forces compressing the slabs during their transmission. The slabs are generally rectangular and have their corners cut off to form cants. The slots are disposed parallel to the small sides of the rectangle. The two groups of slabs are precompressed by rods passing by the slabs adjacent to their cants.

3,637,089

RAILWAY CAR COUPLER

Karl John Jwuc, North Royalton, and Donald Willison, Lyndhurst, both of Ohio, assignors to Midland Ross Corporation, Cleveland, Ohio

Filed Jan. 9, 1970, Ser. No. 1,696
Int. Cl. B61g 1/06, 7/14
U.S. Cl. 213—153 3 Claims



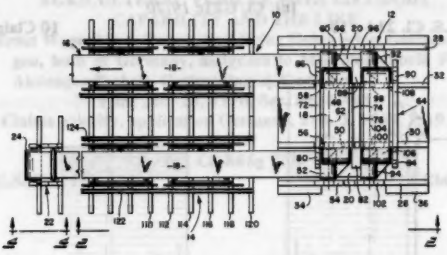
An interlocking type F railway car coupler recognized by the Association of American Railroads (A.A.R.) as alternate standard equipment and which is provided with a hood. The hood has a roof which overlies the knuckle-receiving recess of the F type coupler to afford vertical interlock between two opposed coupled car couplers when the F coupler is intercoupled with an automatic knuckle-type of car coupler known as an A.A.R. Standard E coupler.

3,637,090

ENDLESS CONVEYOR-BELT SYSTEM AND BELT DIRECTION

George R. Murphy, Hudson; Glenn E. Rehn, Olmsted Township, and George L. Plum, Lyndhurst, all of Ohio, assignors to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed Aug. 25, 1970, Ser. No. 66,720
Int. Cl. B65g *15/00*
U.S. Cl. 198—184 11 Claims



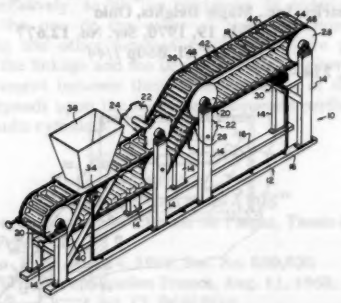
There is provided an improved belt-storage system and apparatus useful therewith, characterized by a belt direction changing and translating apparatus effective to change the direction of movement of the belt, e.g. reverse it entirely, and to translate the belt laterally, e.g. so that portions can be disposed alongside each other. One portion is then available for conveying action, and the other for belt storage. The lengths of each may be adjusted upwardly and downwardly, respectively, or vice versa. The apparatus includes supporting framework for pulley systems which coact with each reach of the belt as it enters or leaves the conveyor portion and as it leaves or enters the storage portion, respectively.

3,637,091

MOLDED PLASTIC BELT CONVEYOR

Raymond N. Mickelson, 12424 Guilford Drive, Milwaukie, Oreg.

Filed Apr. 7, 1970, Ser. No. 26,339
Int. Cl. B65g *15/00*
U.S. Cl. 198—184 3 Claims



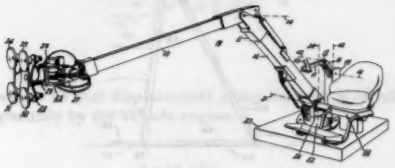
A conveyor utilizes a molded plastic belt having a plurality of longitudinally spaced, open top pocketlike receptacles formed integrally therein, the belt being supported by clips between a pair of cables.

3,637,092

MATERIAL-HANDLING APPARATUS

Raymond L. George; Edward G. Kruszona, both of Schenectady; John P. Laniewski, Scotia, and Norman H. Wood, Schenectady, all of N.Y., assignors to General Electric Company

Filed Apr. 30, 1970, Ser. No. 33,442
Int. Cl. B25j *3/00*
U.S. Cl. 214—1 CM 6 Claims



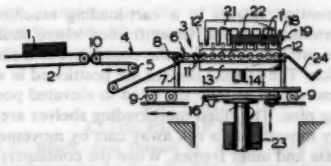
An articulated boom having a single joint intermediate the ends thereof is pivoted at one end about a horizontal axis of a support member. The support member is in turn connected to a mount member and pivoted about a vertical axis thereof. The other end of the boom has end effectors and end effector positioning elements located thereon. A control member smaller in size but similar in form to the articulated boom having a single joint intermediate the ends thereof is also pivoted at one end about another horizontal axis of another support member and a handle is provided at the other end thereof. The other support member is connected to the one support member and pivotal to a limited extent about another vertical axis. Hydraulic actuators, control valves and control linkages are interconnected with the boom and the control member so that movement of the handle causes the boom to mimic the movement of the control member and also so that forces encountered by the end effector on the boom are reflected back, reduced in magnitude, however, to the handle held by the operator.

3,637,093

PALLETING APPARATUS

Friedrich Franz Brockmuller, Lengerich of Westphalia, and Karl Haupt, Wolbeck via Munster, both of Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Jan. 6, 1970, Ser. No. 922
Claims priority, application Germany, Jan. 7, 1969, P 19 00 615.6
Int. Cl. B65g *57/22*
U.S. Cl. 214—6 P 9 Claims



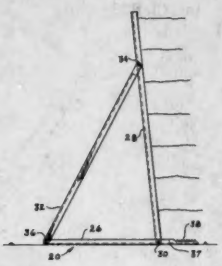
A delivery conveyor, a supply conveyor of variable length, a roller track, a pronged rake movable between the rollers of the roller track for lifting an article from the top surface of the roller track, a sequentially rotatable and vertically movable pallet support next to the roller track, and a second pronged rake movable for sweeping the lifted article onto the pallet from the first-mentioned pronged rake.

3,637,094

BULKHEAD

Donald M. Grey, Selma, Calif., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed May 19, 1970, Ser. No. 38,815
Int. Cl. B65g 1/14
U.S. Cl. 214—10.5 R 3 Claims



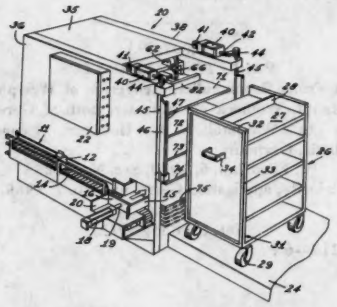
A collapsible bulkhead frame for stacking bulk material against. The bulkhead frame includes a pair of like A-frames mounted on base runners and laterally spaced apart by detachable crossmembers extending between each A-frame. The base runners extend just beyond the A-frames on the stacking side in order that the first column of stacked material will rest thereon while leaning against the corresponding A-frame side.

3,637,095

CART-LOADING MACHINE

David H. Kampfer, St. Paul, Minn., assignor to Conveyor Specialties Company, St. Paul, Minn.

Filed July 8, 1969, Ser. No. 50,015
Int. Cl. B65g 67/00
U.S. Cl. 214—16.6 10 Claims



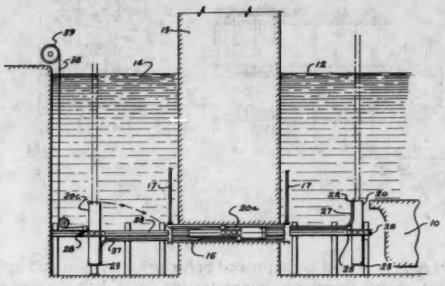
This invention relates to a cart-loading machine having outside, intermediate and inner frames where multiloading shelves are utilized to receive the containers at a single loading elevation. The loading shelves are positioned in a lowered position and raised as they are filled to elevated positions by telescoping pins. The filled multiloading shelves are then automatically moved into a roll away cart by movement of the intermediate and inner frames. When the containers are positioned over the cart storage shelves, the intermediate frame is then withdrawn, which includes the loading shelves. The inner frame, which includes push rods, is held stationary with respect to the outer frame and the cart butt is moved forward with respect to the intermediate frame causing the containers to be removed from the loading shelves and dropped on the storage shelves of the cart. When all the containers are removed, the inner shelf will move back to its original position to facilitate receiving other containers on the multiloading shelves. An automatic cart-turning unit is provided which can be utilized to rotate the cart when half of the cart is filled, exposing the unfilled half. The loading shelves will be returned to their lowered position. In some application an uncasing heat will be utilized to load and accumulate the containers from filled cases.

3,637,096

NUCLEAR FUEL TRANSFER MACHINE

John J. Crate, Wethersfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 27, 1969, Ser. No. 802,942
Int. Cl. G21c 19/20
U.S. Cl. 214—18 10 Claims



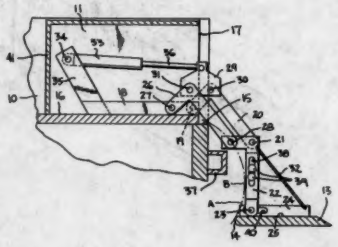
A transfer machine for transferring fuel bundles from a reactor-handling pool to the spent fuel-handling pool through a transfer tube in the reactor containment wall. A load-supporting carriage including its own driving means operates to move horizontally along support rails from the reactor pool to the spent fuel pool. A fuel carrier adapted to receive the fuel elements is pivotally mounted on the load supporting carriage with its vertical orientation established by interaction between guide rollers mounted on the fuel carrier and guide rails. These guide rails are arranged so that the fuel carrier is in a vertical upright position in each of the pools while it is guided to a horizontal position for transfer through the transfer tube.

3,637,097

POWER-OPERATED TAILGATE WITH MAXIMUM REARWARD DISPLACEMENT BETWEEN FULLY ELEVATED AND FULLY LOWERED POSITIONS

Robert R. Horowitz, Shaker Heights, Ohio, assignor to S&H Industries, Inc., Maple Heights, Ohio

Filed Feb. 19, 1970, Ser. No. 12,677
Int. Cl. B60p 1/44
U.S. Cl. 214—77 P 9 Claims



A power-operated tailgate mechanism having pairs of bell-crank lever arms pivotally mounted on the bed surface of a cargo body and having their outer ends pivotally connected

to a support arm which is attached to the tailgate. The relationship of the pivotal connections is such as to provide a parallelogram linkage for the purpose of maintaining the tailgate surface in a load-carrying attitude during elevating and lowering movement of the tailgate. Power means, such as an hydraulic cylinder, is connected to an actuating arm which interconnects the lever arms for simultaneous movement. Maximum rearward displacement of the tailgate occurs below the level of the bed of the cargo body.

3,637,098

AGRICULTURAL VEHICLE WITH LIFT-BODY CAPABILITY AND THE LIKE

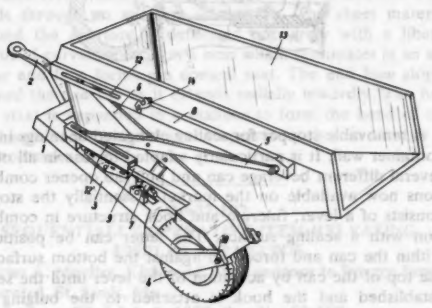
Ernst Wagenblast, Singen, and Heinz Hohlwegler, Gottmadingen, both of Germany, assignors to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

Filed Jan. 28, 1970, Ser. No. 6,448

Claims priority, application Germany, Feb. 3, 1969, P 19 05 164.0

Int. Cl. B65g *7/00*

U.S. Cl. 214—314 **11 Claims**



An agricultural vehicle with a fork-shaped frame is provided with a lifting linkage and tilting beams carrying the linkage. The linkage may be used for raising a container from the ground and lowering it again. Hydraulic cylinders are provided which serve both to move the container upwards and, alternatively, to tilt the container. In order to make possible the one or the other of these functions, while preventing the other function catch means are provided between the linkage and the beams in order to prevent relative movement between them. The operation of the catch means depends upon the movement sequence performed by the hydraulic cylinders.

3,637,099

ELEVATING APPARATUS

Jean Georges Perrier, 84 Chemin de l'aigas, Tassin-la-Demi-Lune, France

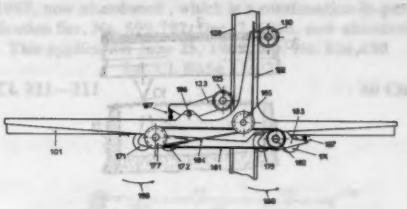
Filed Aug. 14, 1969, Ser. No. 850,030

Claims priority, application France, Aug. 11, 1968, 50306

Int. Cl. B66f *9/16*

U.S. Cl. 214—660 **4 Claims**

Elevating apparatus for motor vehicles comprising vehicle supporting platforms each inclined slightly to the horizontal and supported by a cradle which is movable up and down inclined or vertical guide rails; each cradle is connected by a power transmission mechanism to means for bodily moving the platform (and vehicle) along the rails. The power transmission mechanism being operated at least partially by the vehicle engine through the intermediary of the driven wheels



of the vehicle so that displacement along the rails is effected at least partially by the vehicle engine.

3,637,100

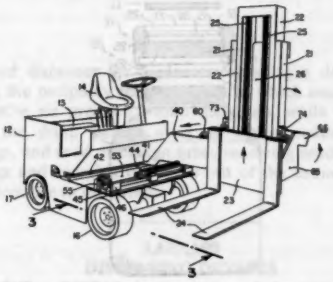
SWING SHIFT LIFT TRUCK

Harry C. McMillan, Cherry Hill, N.J., assignor to Drexel Dynamics Corporation, Horsham, Pa.

Original application Dec. 4, 1968, Ser. No. 781,149. Divided and this application Mar. 13, 1970, Ser. No. 19,158

Int. Cl. B66f *9/10, 9/20*

U.S. Cl. 214—671 **4 Claims**



A swing shift forklift truck is disclosed having a lift assembly attached to the side of a single-swing arm. One end of the singledswing arm is pivotally mounted on the vehicle chassis on a side shift mechanism having a transverse travel across the front of the vehicle. The vehicle is capable of operating either as a front loader by positioning the lift assembly immediately in front of the drive axle, or as a side loader by rotating the swing arm to move the lift assembly to a position parallel to the direction of the vehicle travel. The side shift mechanism is then used to move the lift assembly transversely to enter or remove the forks from the load. The operator is seated on one side of the chassis in a fixed position facing forward. All operator controls are located in the operator's compartment.

3,637,101

CLOSURE CAP LINER

William E. Risch, and Daniel D. Acton, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

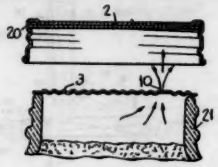
Original application July 15, 1966, Ser. No. 565,622, now Patent No. 3,505,152. Divided and this application Jan. 9, 1970, Ser. No. 10,116

Int. Cl. B65d *23/00, 53/00, 51/16*

U.S. Cl. 215—40 **5 Claims**

A safety seal liner for a closure cap includes a relatively thick inner liner for engaging the inside of the cap cover and a second relatively thin innerseal liner releasably adhered to

the outer surface of the inner liner and having a plurality of perforations extending through the inner liner only for venting a package when the closure cap is removed. The adhesive is spaced from the perforations.

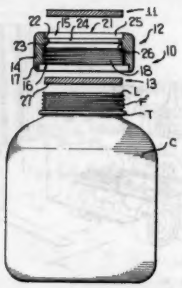


3,637,102

CLOSURES FOR ASEPTIC FILLED CONTAINERS

Fred B. Shaw, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 25, 1970, Ser. No. 40,304
Int. Cl. B65d *23/00, 53/00*
U.S. Cl. 215—40 **11 Claims**



This disclosure relates to closures for aseptic filled containers, and more particularly to a closure which includes a tubular body open at opposite ends, the tubular body being threadably or otherwise conventionally secured to a container finish with the container mouth being closed by a puncturable but self-sealable membrane. The hermetically closed but empty container is thereafter sterilized by retorting, irradiation, or by the injection of a small amount of a sterilizing gas into the container by a needle passed through the puncturable membrane. Thereafter the container is ready for subsequent filling by use of a conventional double-hollow needle technique after which the closure is completed by securing a disc to the closure body immediately above the puncturable membrane.

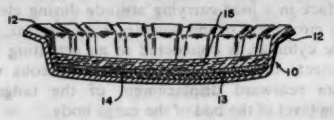
3,637,103

CLOSURE HAVING POLYETHYLENE LINER

Louis R. Ptak, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Original application Nov. 17, 1967, Ser. No. 683,986, now Patent No. 3,522,126. Divided and this application June 1, 1970, Ser. No. 54,069
Int. Cl. B65d *41/02, 53/00*
U.S. Cl. 215—40 **8 Claims**

A container closure is constructed of a metal shell having a primer coating of a mixture of a vinyl chloride copolymer, a thermosetting phenol-aldehyde resin, and an epoxy resin on the interior surface thereof and a polyethylene liner disposed therein and bonded to the primer coated interior surface by an adhesion promoting coating comprised of a blend of polyethylene and polyvinylbutyral.

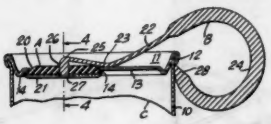


3,637,104

POP TOP CLOSURE

Richard C. Dutnell, 903 Shrider Road, Colorado Springs, Colo.

Filed May 18, 1970, Ser. No. 38,071
Int. Cl. B65d *45/00*
U.S. Cl. 220—25 **9 Claims**



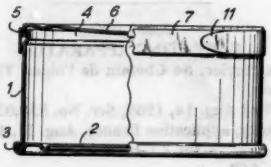
A removable stopper for sealing elongated openings in any container wall. It is particularly adapted for use in all of the several different beverage can and pull tab opener combinations now available on the market. Essentially the stopper consists of a lever, fulcrum and hook structure in combination with a sealing surface. The latter can be positioned within the can and forced up against the bottom surface of the top of the can by actuation of the lever until the seal is established and the hook is attached to the bulging rim around the top of the can. The advantages of this configuration are that one stopper can be used for all of the different pull-tab-type of elongated openings, that the use of the mechanical advantage of the lever creates a tighter seal than might otherwise be possible, and that any pressure buildup which may develop in the can contributes to, rather than detracts from, the sealing of the container.

3,637,105

PULL-STRIP OPENING MEANS

Michel Leblois, Quimper, France, assignor to Societe Metallurgique de Douarnenez, Douarnenez (Finistere), France

Filed Nov. 20, 1969, Ser. No. 878,515
Claims priority, application France, Nov. 29, 1968, 175905
Int. Cl. B65d *17/24*
U.S. Cl. 220—53 **6 Claims**

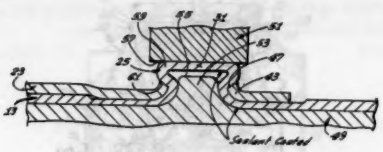


A tinned-food can which can be opened manually by the consumer without the aid of a key or a tool, comprising a body and a spigoting lid, the joint being covered by a metal strip less than one-tenth of a millimeter thick welded or bonded to the edge of the lid and to the wall of the can body.

3,637,106
PULL-TAB SECURED BY RIVETED JOINT

Omar L. Brown, Kettering, Ohio, and George F. Smyth, Los Angeles, Calif., assignors to Dayton Reliable Tool & Mfg. Company, Dayton, Ohio

Filed Dec. 2, 1969, Ser. No. 881,408
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 10 Claims

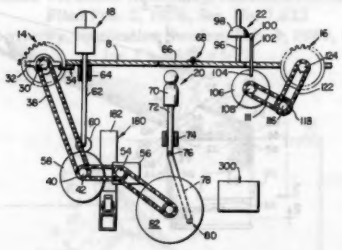


A container wall having a tear portion attached to a tab by a hollow rivet which is formed in the tear strip and which extends through an aperture in the tab. The sheet material around the aperture is deformed outwardly with a liberal radius of curvature to form a boss which terminates in an annular end face forming a conical seat. The end face slopes toward the can top as it extends radially inwardly. The hollow rivet is expanded in a manner to form the head of the rivet against the conical seat to permanently join the tab to the container wall.

3,637,107
SEQUENTIALLY OPERATIVE ITEM-RELEASING DISPLAY APPARATUS

Charles A. Mueller, Kirkwood, Mo., assignor to Interco Incorporated, St. Louis, Mo.

Filed July 9, 1970, Ser. No. 53,458
Int. Cl. A63h *29/22*
U.S. Cl. 221—3 9 Claims

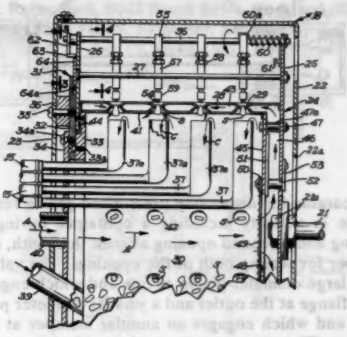


There is disclosed a sequentially operative item-releasing display apparatus incorporating a coordinated series of moving elements which serve to effectively present a simulated path of movement for an item through the apparatus operating simultaneously with moving elements of an amusing nature and means producing an exciting sound, all for purposes of stimulating the imagination and amusing an individual, such as a child, viewing the device. Moreover, the device, at the end of its sequence of operation, releases a given item therefrom, thus creating the illusion that the item has followed the simulated path of movement through the device.

3,637,108
SEED PLANTER

Leo J. Loesch, and Claude E. Loesch, both of Kimball, Minn.

Continuation-in-part of application Ser. No. 684,357, Nov. 20, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 599,792, Dec. 7, 1966, now abandoned. This application June 25, 1969, Ser. No. 836,480
Int. Cl. B65g *15/02*
U.S. Cl. 221—211 40 Claims

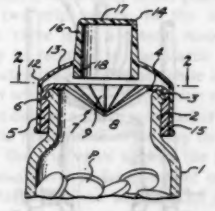


A seed dispenser for a planter including a drum with a shell at the periphery with openings in which seeds are held by positive air pressure within the drum, while moving air within the drum sweeps away all excess seeds from the openings, and seed discharge tubes receiving seeds from said openings and carrying the seeds out of the drum by the air under pressure in the drum.

3,637,109
DISPENSING DEVICES

John J. Stifter, 33084 Lake Road, Avon Lake, Ohio

Filed Nov. 12, 1969, Ser. No. 875,660
Int. Cl. A47f *1/00*
U.S. Cl. 221—310 6 Claims

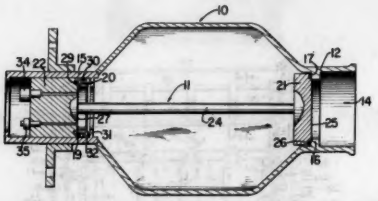


A pill or other particle container has a transverse diaphragm adjacent to its open end having a conical central portion radially slotted outwardly from the center to provide converging tongues which normally close the container and retain the pills or particles therein. A cap for the container has a flexible end wall and a downwardly open socket with an inwardly projecting annular wall whereby the container is inverted, the end wall is depressed to insert the annular wall through the tongues which flex outwardly, and pills or particles in a predetermined amount drop into the socket.

3,637,110
FRICTIONLESS INERTIA RESPONSIVE GAS DISPENSING APPARATUS

John Cirillo, Glen Ridge, and Gerald Durstewitz, Passaic, both of N.J., assignors to Walter Kidde & Company, Inc., Belleville, N.J.

Filed July 15, 1970, Ser. No. 54,914
Int. Cl. B67b 7/100
U.S. Cl. 222—3 6 Claims

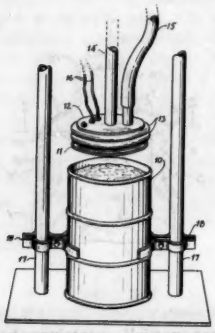


Apparatus for dispensing pressurized gas in response to a change in velocity including a container having an outlet opening and a second opening aligned therewith, and a valve member for sealing both of the openings. The valve member has a large diameter piston at one end which engages an annular flange at the outlet and a smaller diameter piston at the other end which engages an annular member at the second opening. The pistons are provided with face seals and the pressure within the container holds the seals in contact with the annular flange and the annular member to seal the openings. The valve member is of sufficient mass to overcome the pressure forces and open the container in response to a predetermined change in velocity of the container. A tubular member at the second opening closely fits the smaller piston so that substantially all of the gas in the container is emptied through the outlet opening.

3,637,111
HEATING SYSTEM

Mabry L. McCreary, St. Louis, Mo., assignor to Inmont Corporation

Filed Aug. 29, 1967, Ser. No. 664,131
Int. Cl. B67d 5/62
U.S. Cl. 222—146 H 2 Claims

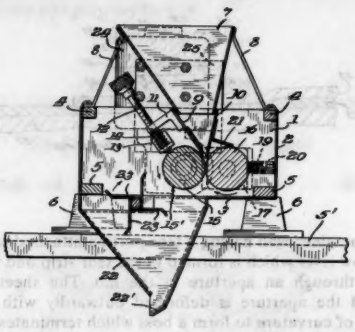


This invention relates to apparatus for substantially simultaneously heating and pumping out thermoplastic or other meltable materials from shipping drums or similar receptacles. The apparatus broadly comprises a movable head carrying a heating coil on the underside thereof. The head is formed so as to fit snugly in the interior of the receptacle to be emptied. The heating coil is attached to but spaced from the underside of the head. Means are provided to advance the head into the receptacle and to pump the melted material therefrom.

3,637,112
MACHINE FOR DISPENSING AND DISTRIBUTING DRY FLOWABLE MATERIALS

Daniel Lamar Christy, R.F.D. 5, Fremont, Ohio

Filed Apr. 26, 1967, Ser. No. 641,725
Int. Cl. G01f 11/20
U.S. Cl. 222—317 8 Claims

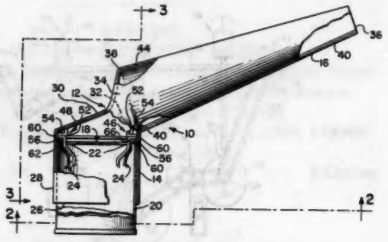


A machine for dispensing and distributing dry flowable materials including a pair of horizontally disposed parallel rolls having one of their sides in contact with each other, and a hopper having a bottom outlet vertically above the contacting sides of the rolls for discharge of material onto the rolls. The rolls are rotated in a direction causing the material to be carried upwardly by one of the rolls for discharge from the other side.

3,637,113
CAN-OPENING DISPENSING FUNNEL

George R. Stehl, Stony Brook, N.Y., assignor to Mobil Oil Corporation

Filed Aug. 22, 1969, Ser. No. 852,302
Int. Cl. B67b 7/26
U.S. Cl. 222—86 10 Claims



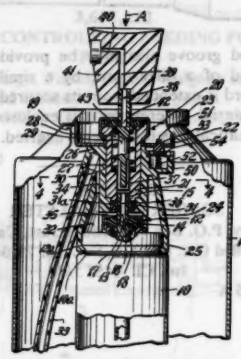
A container-opening, dispenser-type funnel has a hollow body open at the bottom to telescope over a sealed container and has a flattened closed-over top with an opening in it communicating into a tapered hollow dispensing spout, and cutter means are resiliently insertable into the body to form, aligned with the spout, spaced dispensing openings in the container by blades which pierce it and cut apertures through the container top and turn the tabs resulting therefrom downward and outward when the funnel is forced axially down over the container so that radially oppositely arranged gripping means provided in association with the cutter means can hold and seal the container to the funnel during use by tight radial engagement with the cutout tabs.

3,637,114

DEVICE FOR CODISPENSING TWO MATERIALS

Philip Meshberg, 15 Stoneleigh Road, Fairfield, Conn.

Filed Sept. 3, 1970, Ser. No. 69,314
Int. Cl. B65d *83/14*
U.S. Cl. 222—135 8 Claims



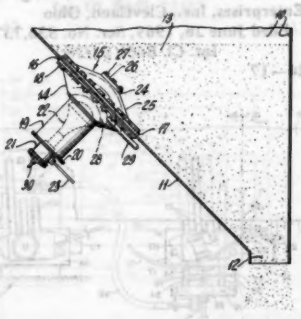
A device for codispensing two materials including a self-contained inner container having a valve means provided with a reciprocating valve stem and an outer container having a valve means including a reciprocating valve stem, said valve stems being disposed in alignment by a novel connector connected to both containers and also said stems having discharge and dispensing ports thereon for controlling the discharge of material from each container and the dispensing of the two materials from the device in response to inward movement of the valve stem on the outer container cooperating with the valve stem on the inner container. The two containers can be filled with material and/or subsequently charged with a propellent simultaneously through the valve stem. Also, safety means are provided to prevent bursting of the outer container should the material become inadvertently mixed.

3,637,115

APPARATUS UTILIZING SONIC VIBRATIONS TO FACILITATE THE MOVEMENT OF PARTICULATE MATERIAL ALONG A SLOPING SURFACE

Bengt L. Holm, Malmo, Sweden, assignor to Kockums Mekaniska Verkstads Aktiebolag, Malmo, Sweden

Filed Feb. 2, 1970, Ser. No. 7,623
Claims priority, application Sweden, Feb. 3, 1969, 1383/69
Int. Cl. B65g *65/72*
U.S. Cl. 222—195 7 Claims



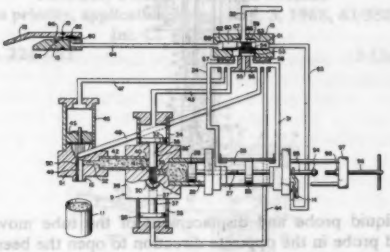
An apparatus for initiating and facilitating sliding of material along a sloping bottom comprises upper and lower members secured on opposite sides of the bottom and covering an opening provided therein, the upper member being a gas-permeable member. A sound transmitter carried by the lower member opens into a chamber formed by the two members and is directed towards the gas-permeable upper member. The bottom provides together with the elements thus supported thereby a vibrationable unit and forms a fixedly mounted diaphragm thereof in order to vibrate when material supported by the bottom is activated by sound oscillations produced by the sound transmitter.

3,637,116

FLUID-OPERATED PISTON FOR METERING GRAVITY FED MATERIAL

Russell G. Rutherford, 8045 Beach Drive, Rockford, Ill.

Filed Feb. 9, 1970, Ser. No. 9,553
Int. Cl. B67d *3/00*
U.S. Cl. 222—309 7 Claims



A pump piston in one cylinder is connected with a power piston operated by compressed air in a second cylinder rigid with the first, and a common rod connecting the pistons extends from the second cylinder so an adjusting screw abutting its end serves to give fine adjustments to the stroke to give accurate measurement of the amount of slurry dispensed in each operation. The slurry is delivered by gravity to the pump cylinder, and air operated valves control the communication between the pump cylinder and the gravity supply conduit and also between said cylinder and a discharge nozzle, where an air operated plunger clears the nozzle of slurry at the end of each discharge. A servo valve cooperates with two trip valves to control the air flow for operating the power piston, as well as the air-operated valves and nozzle plunger, one trip valve being operated automatically at the end of the forward stroke of the pistons to start the return stroke and the other being either operated automatically by a can moving into filling position or at the end of the return stroke of the pistons. The servo valve is of novel plastic construction, as are also the two trip valves. In the servo valve, the reciprocable slide valve is of a plastic material having appreciable lubricity in relation to the plastic material of the seat for easy operation and long wear, while in the trip valves both the body part with the valve projection on it and the fulcrummed arm that carries a valve seat gasket are of extremely hard rigid plastic material to avoid any flexing of the arm in the opening of the trip valve against the resistance of its return band, close accuracy of movement of this arm both ways being important for close accuracy of measurement of the material dispensed.

3,637,117

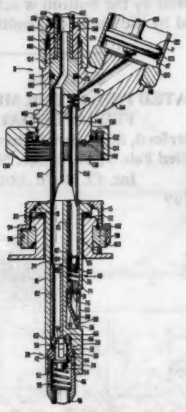
KEG TAPPING DEVICE

Mack S. Johnston, Rolling Hills, Calif., assignor to Republic Corporation, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 773,389, Nov. 5, 1968, now Patent No. 3,550,818. This application Nov. 21, 1969, Ser. No. 878,708
Int. Cl. B65d *83/00*
U.S. Cl. 222—400.7 9 Claims

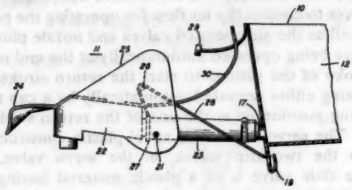
The device comprises a keg adapter mounted about a keg opening and a dispenser coupler releasably coupled to the

keg adapter having gas inlet and beer dispensing outlet passages terminating in two side-by-side probes depending from the coupler. The liquid probe is movably mounted in the coupler and biased in one direction. An inverted J-shaped tube is carried by the coupler in communication with



the liquid probe and displacement of the tube moves the liquid probe in the opposite direction to open the beer valve in the keg adapter. The gas passage is in communication with a hand operated portable plunger-type pump whereby gas is provided through the keg adapter into the keg.

3,637,118
SELF-CLOSING LIQUID DISPENSER
John Petrocy, 2 Metuchen Ave., Woodbridge, N.J., and Alfred DeStefano, 48 Kenwood Drive, Woodcliff Lake, N.J.
Filed Feb. 9, 1970, Ser. No. 9,888
Int. Cl. B67d *3/00*
U.S. Cl. 222—517 **6 Claims**



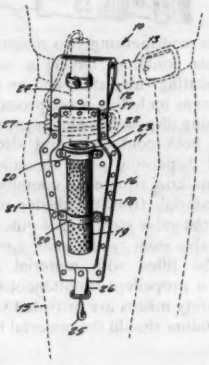
This invention relates to a dispenser for a liquid container wherein the dispenser includes a spout, and a container and a collapsible tube. The tube interconnects the container and the spout and includes spring means as an integral part thereof. The spring means automatically closes the spout which causes the tube to collapse and prevents the flow of liquid through the tube.

3,637,119
METHOD AND TOOL FOR EVERTING TUBULAR CLOTH MATERIAL
Thomas O. Blair, 8026 S.E. Powell Blvd., Portland, Oreg.
Filed Apr. 13, 1970, Ser. No. 27,771
Int. Cl. A41h *43/00*
U.S. Cl. 223—39 **8 Claims**

An exerting tool for turning tubular cloth material inside out comprises an elongated rod provided adjacent at least one of its ends with an annular groove. One end of tubular cloth material to be exerted is placed over said groove and a plurality of windings of thread is wrapped tightly about the material in the groove to secure the material to the tool. The tubular material then is pushed over said secured end, whereupon it is turned inside out. A second groove adjacent

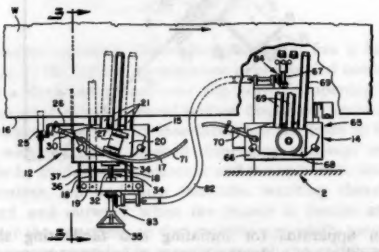
the first named groove also may be provided in which to secure one end of a filler cord, by a similar wrapping of thread. The cord is extended from its secured end away from the tubular material, whereupon it is enclosed in the tubular material automatically as the latter is exerted.

3,637,120
SOLDER IRON HOLSTER
William C. Clay, P.O. Box 931, Ridgecrest, Calif.
Filed Oct. 8, 1970, Ser. No. 79,041
Int. Cl. A45f *5/00*
U.S. Cl. 224—5 A **4 Claims**



A holster attachable to a belt worn by a person, the holster removably supporting a soldering iron, the holster including a cowhide leather strap backed by an asbestos paper, the leather strap supporting a galvanized pipe core with six turns of asbestos paper around the pipe core which receives the soldering iron, and a wire cage fitted therearound and secured by straps to the leather strap.

3,637,121
WEB GUIDING AND SPREADING APPARATUS
Alexander V. Alexeff, Cleveland, Ohio, assignor to Alexeff-Snyder Enterprises, Inc., Cleveland, Ohio
Filed June 26, 1969, Ser. No. 836,737
Int. Cl. B65h *25/26*
U.S. Cl. 226—17 **13 Claims**



Apparatus includes plural expander or guide heads adjacent opposite edges of fabric web material to be guided,

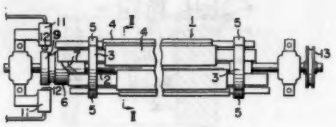
with a drive between two or more expander heads for simultaneous adjustment of one by another for movement of the expander heads in and out of the fabric path or varying the cant angles. Remote controls may also be provided and operated either automatically or manually to effect such adjustments of the expander heads.

3,637,122

DEVICE FOR CONTROLLING FEEDING POSITION OF FABRIC

Yoshiyuki Tokunaga, Fukui, Japan, assignor to Fukui Seiren Kako Kabushiki Kaisha, Fukui-ken, Japan

Filed May 21, 1970, Ser. No. 39,212
Int. Cl. B65h *25/26*
U.S. Cl. 226—20 **3 Claims**



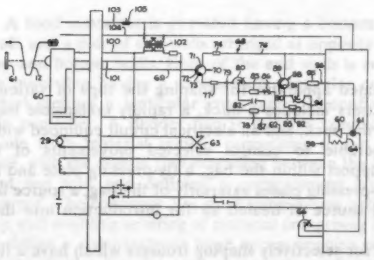
A device for correcting transverse position of a fabric which is continuously fed in longitudinal direction into a treating machine, such as a dyeing machine, which comprises a correcting roll around a part of which said fabric is carried while it is fed to said machine, said correcting roll including a shaft, means for driving said shaft, flanges fixedly formed on said shaft adjacent its opposite ends, a plurality of slidable bars so supported by said flanges that the bar is fixed relative to the flanges in the peripheral direction but slidable relative to the latter in the axial direction, a cylindrical cam for imparting reciprocal sliding motion to the respective slidable bars and being freely rotatable on said shaft, a first stop means for stopping said cylindrical cam in first position where sliding motion is exerted to the slidable bars in one direction at said part of the correcting roll, a second stop means for stopping said cylindrical cam in second position where sliding motion is exerted to the slidable bars in the opposite direction at the same part of the correcting roll and selvedge-sensing means for sensing the selvedge of the fabric to produce correcting signal which is applied to one of the first and second stop means to stop the cylindrical cam in one of said first and second positions.

3,637,123

STRIP FEED CONTROL APPARATUS

Clarence O. Jones, Jr., Eggertsville, N.Y., assignor to Niagara Machine & Tool Works, Buffalo, N.Y.

Filed May 14, 1970, Ser. No. 37,217
Int. Cl. B65h *23/22*
U.S. Cl. 226—42 **13 Claims**



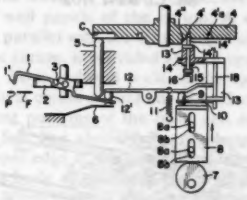
A strip feed control apparatus for controlling the size of a loop formed in a continuous strip of material extending between a strip issuing machine and a takeup or strip using machine. The apparatus comprises a photoelectric control for producing an on-off output signal alternating between two levels dependent on whether or not the photoelectric light beam is interrupted by the loop. An electrical circuit means converts this alternating on-off signal into a smoothly variable DC signal proportional to the rate of the alternating on-off signal. The variable DC signal is effective to adjust the speed of a variable DC drive motor which, in turn, adjusts the speed of the strip feed to vary the size of the loop so as to approach a predetermined optimum loop size.

3,637,124

FILM INTERMITTENT FEED MECHANISM IN FILM PROJECTORS

Yasuo Ueno, Saitama-ken, Japan, assignor to Fuji Shashin Koki Kabushiki Kaisha, Saitama-ken, Japan

Filed July 30, 1969, Ser. No. 846,206
Claims priority, application Japan, Aug. 3, 1968, 43/55018
Int. Cl. G03b *1/22*
U.S. Cl. 226—62 **2 Claims**



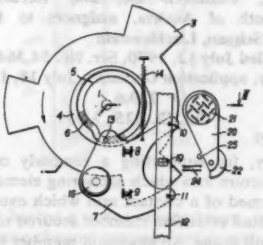
A film intermittent feed mechanism in a film projector, comprising claw means adapted to engage a row of perforations provided along a side edge of the film charged and cam means for operating said claw means to bring it in engagement with said film perforations and thereby to feed the film intermittently, said mechanism further comprising means for stopping feed of the film by holding said claw means out of engagement with the film perforations so as to obtain a still picture and means for advancing the film one frame during the still picture projecting operation so as to obtain a still picture of another frame.

3,637,125

INTERMITTENT DRIVE MECHANISM FOR A CINEMATOGRAPHIC APPARATUS

Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed Oct. 24, 1969, Ser. No. 869,291
Claims priority, application Austria, Oct. 30, 1968, A 10601/68
Int. Cl. G03b *1/22*
U.S. Cl. 226—62 **15 Claims**



An intermittent drive means in a cinematographic apparatus adapted to be used with perforated film, wherein the

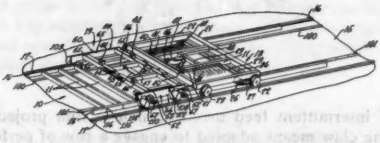
intermittent drive means includes cam means. Claw means are controlled by the cam means and are adapted to transport the film. The claw means are further displaceable perpendicularly to the plane of the film to engage and disengage the perforation holes of the film in synchronism with the film-transporting movement. Biasing means urge the claw means in perforation engaging direction. Electromagnetic means have an energized and a deenergized condition. In the energized condition the electromagnetic means are adapted to hold the claw means in perforation disengaged position against the force of the biasing means. In the perforation engaged position of the claw means the attractive force of the electromagnetic means are smaller than the force of the biasing means. In the perforation disengaged position of the claw means the attractive force of the electromagnetic means are larger than the force of the biasing means.

3,637,126

NAILING MACHINE

Clarence R. Heterick, Jr., Orange, Calif., assignor to Boise Cascade Corporation, Boise, Idaho

Filed Nov. 24, 1969, Ser. No. 879,152
Int. Cl. B27f *7/02*
U.S. Cl. 227—3 **9 Claims**



A device for nailing together a framework including a first support for elements of the framework, and a second support movable relative to the first support, the second support having opposed nailing gun means thereon which are operable by trigger arrangements activated upon engagement by members of the framework to be nailed, there being means biasing the framework members inwardly to impose a compressive force on them, together with pulley means for properly aligning the framework members at the time nails are driven. A traction unit may be used to pull the nailing unit over the first support in the nailing operation, while being capable of lifting the nailing unit above the first support during return movement in which the nailing unit is inoperative. The nails are driven while the device is in motion.

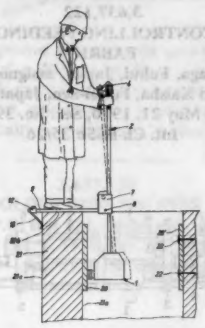
3,637,127

SUPPORT ASSEMBLY FOR A REMOTELY FIRED POWDER-CHARGE-OPERATED BOLT SETTER

Elmar Maier, Feldkirch-Tisis, and Herbert Rangger, Frastanz, both of Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed July 13, 1970, Ser. No. 54,364
Claims priority, application Germany, July 18, 1969, P 19 36 739.6
Int. Cl. B25c *1/08*
U.S. Cl. 227—9 **4 Claims**

An assembly, for supporting a remotely operated bolt setter on a structure into which anchoring elements are to be inserted, is formed of a contact arm which extends laterally from an elongated extension member secured to and extending from the bolt setter. An abutment member is movably attached to the contact arm at a position spaced laterally from the extension member for holding the bolt setter on the structure so that by pivoting the extension member relative to the contact arm the bolt setter can be urged in the direction in which the anchoring elements are to be inserted



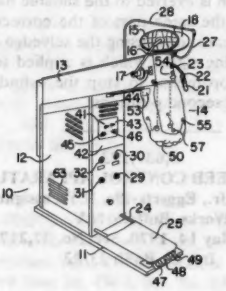
for affording a compressing safety action against the barrel of the bolt setter before it can be fired.

3,637,128

AUTOMATED APPARATUS FOR TOPPING TROUSERS AND METHOD OF OPERATING THE SAME

Bertram G. Blevens, and Frank H. Richterkessing, both of Louisville, Ky., assignors to The Cissell, W. M. Manufacturing Company, Louisville, Ky.

Filed Mar. 2, 1970, Ser. No. 15,499
Int. Cl. D06c *5/00*, *15/00*; A41h *5/02*
U.S. Cl. 223—73 **23 Claims**



An automated apparatus for shaping the tops of various types of trousers includes a buck, a rapidly collapsible bag mounted on the buck, and an electrical circuit equipped with switches operable to control selected movements of a waistband support within the bag, a fly-pressing plate and a pair of pleat-pressing plates exteriorly of the bag, a source of steam and a source of heated air for introduction into the bag.

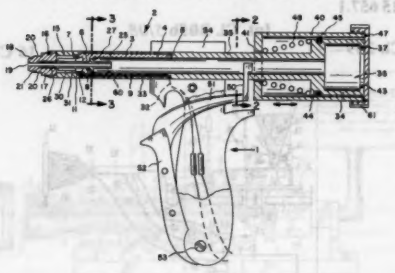
A method for selectively shaping trousers which have a fly but no pleats, or which have a fly together with pleats, or which comprise slacks with neither fly nor pleats, is disclosed with sequences of treatment commensurate with the nature of the fabric material or construction of such trousers.

3,637,129

DESOLDERING TOOL

Harry Kaufman, New Rochelle, N.Y.

Filed Apr. 16, 1970, Ser. No. 29,067
Int. Cl. B23k *1/00*
U.S. Cl. 228—20 13 Claims



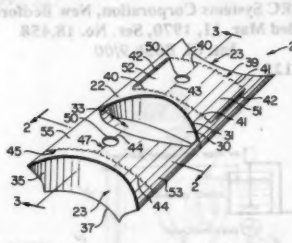
The disclosure describes a desoldering tool of simple construction whose active tip, which is heated by a coil, is mounted on a solder-conducting tube in turn mounted on a heat-insulating tube which leads to a suction-creating assembly of the dashpot-type having a wide bore and an outer displaceable housing sealed by gaskets to the tool interior. When a pistol gain is squeezed, the housing is displaced increasing the interior volume and creating a suction at the heated tip capable of sucking in molten solder. A modification uses air pressure to actuate the displaceable housing.

3,637,130

CONTAINER AND BLANKS FOR MAKING SAME

Melville T. Farquhar, Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Aug. 10, 1970, Ser. No. 62,263
Int. Cl. B65d *5/48, 3/00, 1/34*
U.S. Cl. 229—28 22 Claims



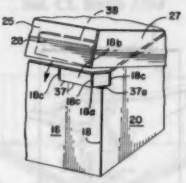
A food container is provided having a bottom wall, a top wall, and a pair of end walls arranged at opposite ends of the top and bottom walls. Each of the end walls is comprised of an inner flap having a substantially lenticular configuration which defines a lenticular cross-sectional configuration for the container. A divider flap is foldably connected to and made from material initially comprising a part of the top wall, with the divider flap extending between the bottom wall and top wall and defining a compartment on each side thereof. The container has weakening means provided in its top wall enabling severing of material comprising the top wall to define a comparatively large access opening on each side of the divider flap for easy access into each compartment; and, upon severing such material the lenticular extension flaps and bottom wall enable the container to be used as a deep substantially leak-proof serving dish.

3,637,131

CARTON WITH LOCKING MEANS FOR RECLOSABLE COVER

Richard F. Gulliver, Waco, Tex., assignor to Gulf States Paper Corporation, Tuscaloosa, Ala.

Filed Sept. 8, 1970, Ser. No. 70,272
Int. Cl. B65d *5/22, 5/26*
U.S. Cl. 229—36 10 Claims



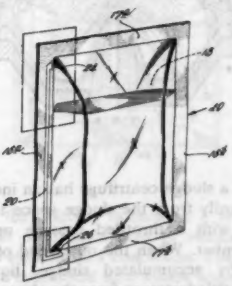
A carton formed from a single blank of foldable paperboard or the like having a reclosable cover which is hinged to the upper edge of the rear wall panel of the carton proper or tray portion and provided with front and end apron panels, which, when the cover is closed, respectively overlap the front and end wall panels of the carton. A relatively short horizontal cut, parallel with the upper edges of the front and end walls of the carton, is provided at each upper end corner formed by the front and end walls of the carton. This cut bisects the vertical crease or fold line at each corner, extending into adjacent portions of the front and end walls. That portion of the fold line above the vertical crease which extends to the upper edge of the corner is parallel with but offset towards the body of the front panel from the fold line below the cut. When the end flaps are folded at right angles along these creases, the portions above the horizontal cut are shifted outwardly from the face of the panel and present a detentlike projection, designed to coact with aligned keeper cutouts formed in the cover glue flaps to releasably lock the cover in closed position. The lock is released by applying a firm upward force on the front portion of the cover, causing an upward and inward pressure on the detents, whereby they snap out of their keeper cutouts. Reclosing the cover automatically relocks the same.

3,637,132

PRESSURE RELEASE PACKAGE OR CONTAINER

Oscar S. Gray, c/o Gray Industries, Inc., P. O. Box 23518, Fort Lauderdale, Fla.

Filed Jan. 9, 1970, Ser. No. 1,741
Int. Cl. B65d *33/00*
U.S. Cl. 229—53 8 Claims



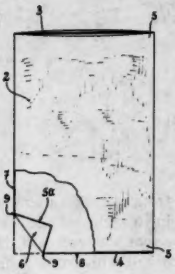
A container having a sealed compartment, means defining a pressure release channel communicating with said compartment and at least one rupturable dam in said channel to vent said compartment when the pressure in said compartment reaches a predetermined level.

3,637,133

PACKAGE FOR LIQUIDS AND FOOD PRODUCTS

Leon Doyen, Avenue Pasteur, St. Didier on Mt. d'Or, and Louis Doyen, 95 Rue Johot Curie, Lyon 5e, both of France

Filed Apr. 22, 1970, Ser. No. 30,644
Claims priority, application France, June 2, 1969, 6916826
Int. Cl. B65d *33/00*
U.S. Cl. 229—53 5 Claims



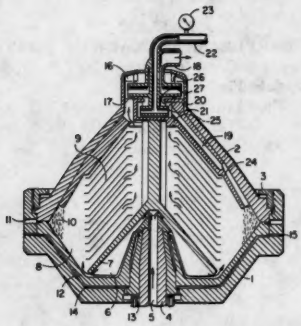
A package for liquids or food products, of the kind comprising a tubular sheath of plastic or the like material, each end of which is closed by a transverse weld, so as to form a bag adapted to be opened by cutting off one of the corners thereof, characterized in that at least one of said corners is inserted inside said bag to form a tightly closed concave cavity, while it is possible to open the package by any known means.

3,637,134

APPARATUS FOR INDICATING THE SLUDGE LEVEL IN CENTRIFUGES

Kurt Nelson, Wappingers Falls, N.Y., assignor to The DeLaval Separator Company, Poughkeepsie, N.Y.

Filed Jan. 21, 1970, Ser. No. 4,600
Int. Cl. B04b *11/00*
U.S. Cl. 233—19 A 8 Claims



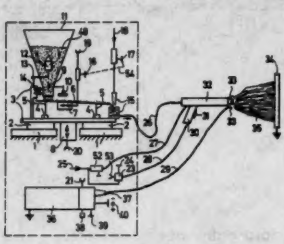
The rotor of a sludge centrifuge has an indicating channel extending inwardly from the sludge space to the rotor axis and provided with a throttled passage opening into the separating chamber. When the outer end of this channel is not clogged by accumulated sludge, liquid discharging through the throttled passage from the channel is replaced by liquid entering its outer end, so as to maintain a certain liquid level or pressure at the inner part of the channel; but when the above-mentioned replacement of liquid is arrested by the occurrence of such clogging, the resulting change in this liquid level or pressure is sensed by a suitable device communicating with the channel.

3,637,135

METHOD OF AND APPARATUS FOR SPRAY COATING COMPONENTS

Manfred H. Luderer, Weiler Zum Stein, and Anton Ettenhofer, Winnenden, both of Germany, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Apr. 25, 1969, Ser. No. 819,216
Claims priority, application Germany, Apr. 26, 1968, P 17 71 263.9; Jan. 14, 1969, G 69 01 158.1; Mar. 27, 1969, P 19 15 657.1
Int. Cl. B05b *5/08*
U.S. Cl. 239—3 16 Claims



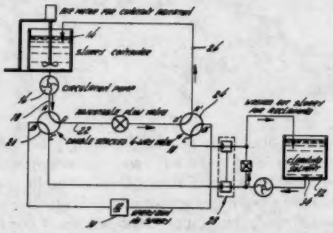
An arrangement for spray coating components with a dry material, such as powder, or a wet material, such as paint, includes a removable and replaceable supply container for the material in which the material is circulated and is supplied to a feeding trough through a regulatable discharge opening. Within the container and the feeding trough the material is selectively vibrated and then delivered to an injector where compressed air is added and the mixture of compressed air and material is conveyed through a closed passageway to a spray gun equipped with high-voltage electrodes at its outlet. The arrangement includes a control panel for selecting the voltage and polarity at the spray gun outlet and for regulating the vibration effect and the supply of air provided to the apparatus.

3,637,136

SPRAY GUN SYSTEM FOR SLURRY

Hendrik F. Bok, 52 Thompson Street, Fairhaven, Mass., assignor to EPEC Systems Corporation, New Bedford, Mass.

Filed Mar. 11, 1970, Ser. No. 18,458
Int. Cl. B05b *9/00*
U.S. Cl. 239—125 9 Claims

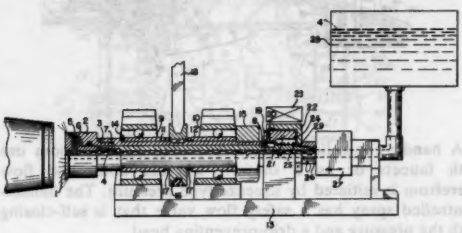


A spray gun for liquid slurry of the type using atomized air as the propellant medium, particularly a four-way valve system for said gun enabling selective spray of solvent or slurry while continuously flowing solvent and slurry through closed circulation systems. The continuous flowing of solvent through the gun and absent the slurry enables a clean flushing of the gun and eliminates slurry buildup in the gun inner chambers and nozzle.

3,637,137
CENTRIFUGAL ADHESIVE APPLICATOR

Charles J. Chebuhar, Chicago, and Russell C. Buhle, Clarendon Hills, both of Ill., assignors to Continental Can Company Inc., New York, N.Y.

Filed Oct. 17, 1969, Ser. No. 867,294
Int. Cl. B05b *3/10*
U.S. Cl. 239—223 8 Claims

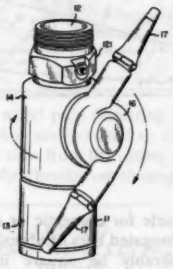


An adhesive applicator having a sleeve with a valve seat at one end and a tube within the sleeve. A poppet valve is mounted at one end of the tube. The poppet valve coacts with the valve seat for controlled flow of adhesive through the tube. The tube, sleeve and valve are rotated at a rapid rate in bearings. The opening of the poppet closure is varied by solenoid actuation. As the adhesive applicator rotates, adhesive is thrown in a radial direction from the valve.

3,637,138
TANK CLEANING MACHINE

James H. Rucker, San Ramon, Calif., assignor to Sybron Corporation, Rochester, N.Y. and Cloud Company, Alameda, Calif.

Filed May 18, 1970, Ser. No. 38,256
Int. Cl. B05b *3/00*
U.S. Cl. 239—227 6 Claims

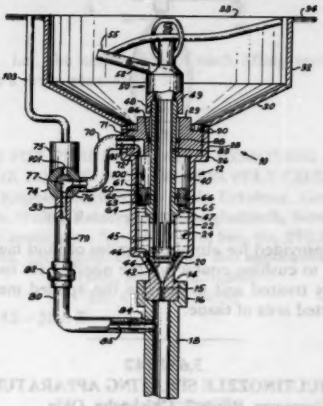


Hydraulic tank-cleaning apparatus having a stationary housing, a second rotatable housing for rotation about the stationary housing axis and a third rotatable nozzle housing for rotation about an axis normal to the stationary housing axis. Apparatus is driven by means of an impeller and a compact reduction gear train comprising a first and second set of spur and pinion gear assemblies coaxially arranged along a first and second shaft respectively for driving both housings at a speed substantially reduced from that of the impeller.

3,637,139
IRRIGATING DEVICES HAVING A PRESSURE ACTUATED POP-UP SPRINKLER HEAD

Webster Felix, Central Islip, N.Y., assignor to Telsco Industries, Garland, Tex.

Continuation-in-part of application Ser. No. 881,737, Dec. 3, 1969, now abandoned. This application May 3, 1971, Ser. No. 139,396
Int. Cl. B05b *3/04*
U.S. Cl. 239—206 10 Claims

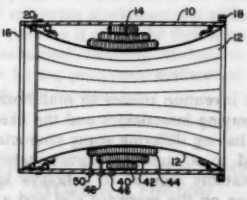


An irrigating device having a housing which can be set in the ground. A sprinkler head is mounted on a rotatable and axially slidable tube in the housing. A ring is fixed on the tube in the housing whereby the tube is lowered to seal a passage in the housing and close off the supply of water to the sprinkler head when water pressure is applied via a valve to the top of the ring. When water pressure on the ring is removed, the pressure will raise the tube so that the sprinkler head discharges water therefrom.

3,637,140
PNEUMATICALLY ACTUATED VARIABLE AREA INLET OR EXHAUST NOZZLE

Stephen T. Palovchik, Hartville, Ohio, assignor to Goodyear Aerospace Corporation, Summit, Ohio

Filed Sept. 3, 1970, Ser. No. 69,196
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.43 9 Claims



A nozzle for the inlet or exhaust of a jet engine which reduces the inlet or exhaust area to reduce noise and to change inlet and exhaust flow conditions. The nozzle consists of an open ended cylindrical tube axially aligned with the engine. The inner circumference of the tube is lined with overlapping leaves extending the length of the tube and hinged to rings at the front and rear ends of the tube. A number of inflatable rings or tori are provided between the leaves and the tube midway between its ends. Inflation of the rings forces the centers of the leaves inwardly, reducing the cross-sectional area of the nozzle.

3,637,141

CUSHION TIP FOR ATOMIZER NOZZLES

Kenneth W. Gores, 1026 112th Ave. N.E., Bellevue, Wash.

Filed Apr. 3, 1970, Ser. No. 26,182
Int. Cl. B05b 9/00
U.S. Cl. 239—326 1 Claim

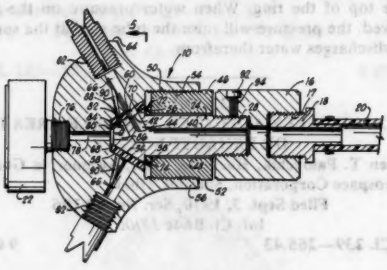
A tip is provided for atomizer nozzles of fluid medicament dispensers to cushion contact of the nozzle with tissue to be medicinally treated and to confine the applied medicament to a restricted area of tissue.

3,637,142

MULTINOZZLE SPRAYING APPARATUS

James E. Gassaway, Route 2, Chickasha, Okla.

Filed Dec. 4, 1969, Ser. No. 881,987
Int. Cl. A62c 31/02
U.S. Cl. 239—394 5 Claims



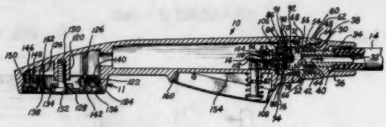
The present invention relates to multinozzle spraying apparatus for spraying insecticides and the like. A plurality of spray nozzles having differing spray characteristics are provided attached to a multiport turret member. The turret member is rotatably secured to a hollow spindle having a hose connection on the rearward end and a seating surface on the forward end thereof for continuously engaging a seating surface formed in the turret member during the rotation of the turret member. The seating surface of the hollow spindle includes a flow port therein, and ports are provided in the seating surface of the turret member each communicated with a separate spray nozzle and positioned with respect to the spindle flow port so that rotation of the turret member brings the ports therein into selective registration with the spindle flow port. Means for indicating the pressure of fluid passing through the apparatus to a selected spray nozzle are provided as well as means for adding selected quantities of dye or other separate ingredient to the fluid.

3,637,143

HANDLE-CONTROLLED SPRAY

Harold Shames, Ardsley; Sidney J. Shames, Briarcliff Manor, both of N.Y., and John F. Logan, Pequannock, N.J., assignors to Melard Manufacturing Corp., Bronx, N.Y., by said Logan

Filed May 28, 1969, Ser. No. 830,216
Int. Cl. B05b 15/06
U.S. Cl. 239—283 4 Claims



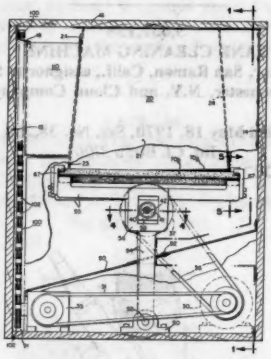
A handle-controlled spray is provided for bathroom use with faucets or as a shower, wherein controlled flow therefrom is initiated by squeeze-type pressure. The handle-controlled spray has a safety flow valve that is self-closing with the pressure and a drip-preventing head.

3,637,144

TRASH PULVERIZER

Dale R. Smith, York, Pa., assignor to York Research & Development Corp., Red Lion, Pa.

Filed June 24, 1970, Ser. No. 49,213
Int. Cl. B02c 1/00
U.S. Cl. 241—100 9 Claims



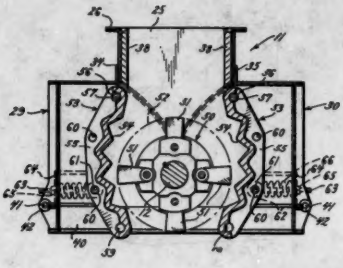
A trash receptacle for domestic or other use is equipped with a series of elongated bars of abrasive material. The bars, which may preferably be square in cross section, are mounted horizontally in side-by-side parallel relation, with opposite corner edges of each bar in the vertical plane of its center axis. The bars are driven in reciprocating manner in their lengthwise directions, with adjacent bars moving in opposite directions. Dry trash of all kinds, including bottles, cans, plastic containers, cardboard containers, paper products, and food remnants, are deposited in the receptacle. The trash contacts the continuously moving reciprocating abrasive bars and is gradually reduced to a pulverized state by the attrition or wearing-away action. The pulverized particles of trash are scooped up and carried by a continuously moving bucket conveyor to a collection bag which is removed from time to time, as by the housewife.

3,637,145

REVERSIBLE MATERIAL REDUCING MILL

Robert M. Williams, Ladue, Mo., assignor to Crusher & Pulverizer Co., Inc., St. Louis, Mo.

Filed Sept. 24, 1968, Ser. No. 761,909
Int. Cl. B02c *13/04*
U.S. Cl. 241—189 4 Claims



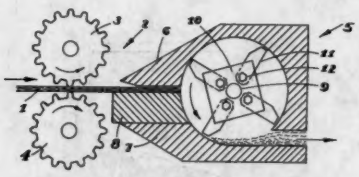
A reversible hammer mill for reducing material, such as metallic objects, in a recycling process, wherein the mill rotor cooperates with impact sections which are adjustably supported to initially obtain a desirable close fitting and to compensate for wear, as well as respond to the momentary presence of uncrushables to open the rotor clearance and relieve the rotor of possible damage.

3,637,146

HAMMERMILL CONSTRUCTION

Charles T. Banks, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 27, 1969, Ser. No. 869,597
Int. Cl. B02c *13/04*, *13/28*
U.S. Cl. 241—194 5 Claims



A hammermill for wood pulp fiberizing has rotary blades, the front faces of which are bevelled so that pulp impacted by the rotors tends to slide from the rotors, avoiding repeated impacts of pulp on pulp, thereby minimizing pulp clots.

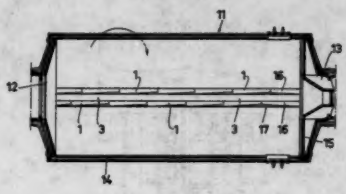
3,637,147

LIFTING MEMBERS IN WEAR LINING FOR ROTARY DRUMS

Robert Gerhard Franz Josef Naredi, Malmo, Sweden, assignor to AB Cementa, Malmo, Czechoslovakia and Skega AB, Ersmark, Czechoslovakia

Filed Oct. 10, 1969, Ser. No. 865,390
Claims priority, application Sweden, Oct. 11, 1968, 13730/68
Int. Cl. B02c *17/22*
U.S. Cl. 241—299 3 Claims

This invention relates to lifting members for the wear lining of rotary drums employed in particle comminuting and sorting apparatus, such as mills, the members being placed in spaced relationship alongside of each other. Separate wear protecting elements are supported between each pair of lifting members, and the lifting members and the associated wear protecting elements are mounted along generatrices of



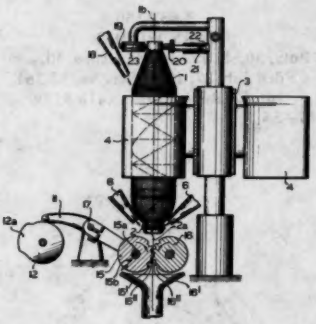
the drum, i.e., the center line of each lifting member coincides with a drum generatrix.

3,637,148

DEVICE FOR PNEUMATICALLY REMOVING THE TIP OR FOOT BUNCH FROM SUPPLY COILS

Wilhelm Kupper, Rickelrath, Kreis Erkelenz, Germany, assignor to Walter Reiners, Monchengladbach, Germany

Original application Nov. 30, 1966, Ser. No. 598,062, now Patent No. 3,464,640. Divided and this application June 6, 1969, Ser. No. 870,888
Int. Cl. B65h *54/86*
U.S. Cl. 242—35.6 E 11 Claims



Device for pneumatically removing the tip or foot bunch from supply coils comprising means for placing the end of a supply coil wound with a bunch, that is to be removed, within an air current so that a thread end in the bunch is exposed, and mechanical removing mechanism for slidingly seizing the thread end and drawing it off in the flow direction of the air current. The mechanical removing mechanism comprises two rotary members having peripheral surfaces at least nearly in engagement with one another.

3,637,149

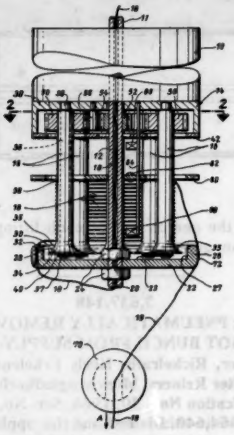
THREAD-STORING DEVICE FOR TEMPORARILY STORING A THREAD

Karl Frei, Morickestrasse 9, 7477 Onstmettingen, Germany

Filed Sept. 11, 1970, Ser. No. 71,520
Claims priority, application Germany, Sept. 20, 1969, P 19 47 727.1
Int. Cl. B65h *51/22*
U.S. Cl. 242—47.09 18 Claims

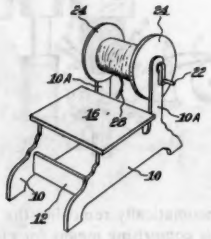
A thread is wound in successive loops at the same end of a stationary holder having an even number of rollers arranged in a circle. Alternate rollers rotate in opposite directions to reduce friction. A rotary thread guide builds up a coil on the rollers from which the leading loop is taken off and supplied to a textile machine, while new trailing loops are laid by the

rotary thread guide. When the number of loops of the wound coil is sufficient, the motor driving the thread guide is



stopped, and then started again when a minimum number of loops remains on the rollers.

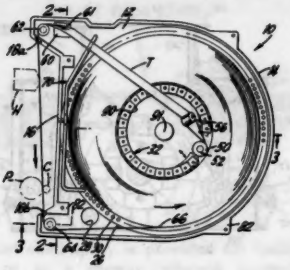
3,637,150
YARN WINDER
Darrell G. Butz, 303 N. Locust St., Genoa, Ill.
Filed July 27, 1970, Ser. No. 58,261
Int. Cl. B65h *75/00;* **A41h** *31/00*
U.S. Cl. 242—54 **1 Claim**



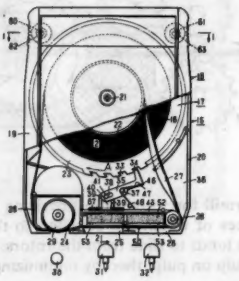
A frame supports a horizontally elongated member upon which yarn can be wound and thereafter unwound, the member being rotatable about a horizontal axis by a crank. The frame supports a compartment below the member for storing work and/or needles.

3,637,151
CONTINUOUS LOOP CARTRIDGE
Frank J. Skwarek, 9 Beacon Hill Road, Port Washington, and John E. Erickson, Glenwood Landing, both of N.Y., assignors to Frank J. Skwarek, Port Washington, N.Y.
Filed Dec. 19, 1970, Ser. No. 3,595
Int. Cl. B65h *75/02*
U.S. Cl. 242—55.19 A **13 Claims**

A continuous tape loop is coiled in a cartridge on a rotatable turntable having a hub made of a V-shaped spring member anchored at its midportion to define semicircular yieldable arms with a gap between their free ends. The spring member also includes pairs of radially directed fingers, each pair supporting a roller to reduce friction between the hub and coil of tape. Tape is unwound from the inner coil convolution through the hub's gap, past suitable guides and a transducer head to return as the outer coil convolution. The yieldability of the hub minimizes friction between the coil turns. One end of a spring-biased brake lever normally engages one of a series of small holes provided on the turntable to lock the turntable against undesired rotation except when the tape is being used at which time tension in the tape acts on the opposite end of the lever to pivot the lever clear of the turntable.



3,637,152
ENDLESS TAPE CARTRIDGE CONTAINING A BRAKE TO PREVENT ROTATION OF THE REEL
Shinobu Okamoto, No. 4, 180, Oaza-Koga, Koga-shi, Ibaragi-ken, Japan
Filed Nov. 4, 1968, Ser. No. 773,257
Claims priority, application Japan, Nov. 18, 1967, 42/97196
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 A **3 Claims**

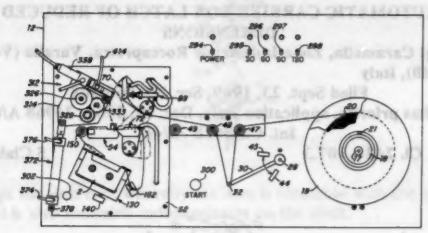


An endless magnetic tape cartridge has a rotatable reel supporting the tape coil and provided with a releasable brake to prevent slackness in the tape during handling and storage. The brake includes serrations inclined to the radii of the reel and a spring-biased locking lever pivoted intermediate a hooked locking end and a slotted end coupled to a T-shaped actuating slide. The actuating slide has an arm slidably mounted and a crossarm adjacent a front opening of the cartridge so that insertion of the cartridge into a player results in the player head engaging the crossarm of the actuating slide to shift it rearwardly to thereby pivot the hooked locking end of the brake from the serrated periphery of the reel to permit rotation of the endless tape.

3,637,153
MACHINE FOR SPLICING AND WINDING TAPE INTO A CASSETTE

James L. King, Sudbury, Mass., assignor to King Instruments, Corp., Waltham, Mass.

Filed Feb. 9, 1970, Ser. No. 9,552
Int. Cl. B65h 19/26, 37/02, 59/06
U.S. Cl. 242—56 16 Claims

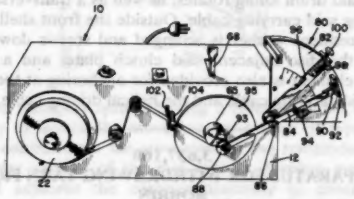


Apparatus for splicing and winding magnetic tape specifically designed for winding tape into cassettes in which the apparatus includes means for splicing magnetic tape to a leader on a first spool, winding a selected amount of tape on said first spool, and splicing the end of said tape to a leader on a second spool. One embodiment is designed to wind predetermined amounts of tape; in another embodiment the amount of magnetic tape that is wound is determined by detection of an information signal recorded on the magnetic tape.

3,637,154
WINDING MACHINE

Francis B. Northup, 725 West End Blvd., Winston-Salem, N.C.

Filed July 31, 1969, Ser. No. 846,547
Int. Cl. B65h 19/26, 17/02
U.S. Cl. 242—56 R 5 Claims

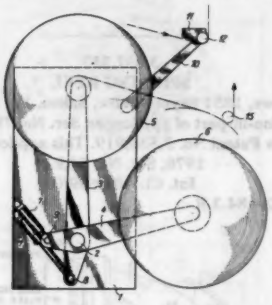


A winding machine for preparing reels of web material having a minimized center opening from conventional wound web material reels in which a frame supports rotatable means for the conventional wound reel of web material and a driving unit for rewinding the web material into a reel having a minimized center aperture. A tension control for the web material is provided, a pair of parallel pins associated with a rotatable supporting member receive the end of the web material for winding thereabout. A rewound reel diameter-regulating apparatus terminates the rewinding operation when the diameter of the rewound reel reaches a predetermined dimension.

3,637,155
ROLL-UNWINDING DEVICE FOR AUTOMATICALLY CHANGING ROLLS AT FULL RUNNING SPEED

Tibor Georges Pato, Chailly, Switzerland, assignor to Maschinenfabrik Winkler, Fallert & Co., AG, Berne, Switzerland

Filed Mar. 3, 1970, Ser. No. 15,973
Claims priority, application Sweden, Mar. 5, 1969, 3055/1969
Int. Cl. B65h 19/18
U.S. Cl. 242—58.1 7 Claims

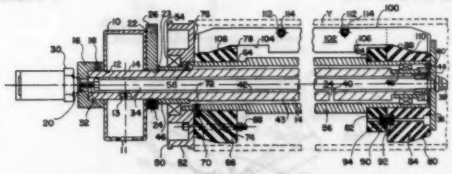


In a roll-unwinding device two pair of support arms are mounted on a support frame for automatically changing rolls of a web-type material for the continuous delivery of the material as it is unwound from successive rolls. The support arms are disposed between laterally arranged support elements of the frame and the support arms of one pair are laterally spaced from the support arms of the other pair. The support arms are pivotally mounted on the frame for movement between a plurality of positions. To afford the movement of two different rolls between the unwinding and replacement positions the length of one pair of support arms between its pivot axis and its roll support axis is different from the length of the other pair of support arms between its pivot axis and roll support axis. Hydraulic piston assemblies or mechanical devices are mounted on the support frame and connected to the support arms for pivoting the support arms through limited pivot angles between the various positions assumed by the rolls in the operation of the device.

3,637,156
EXPANSIBLE MANDREL

Donald O. Shepherd, Route #2, Clover, S.C.

Filed June 1, 1970, Ser. No. 41,819
Int. Cl. B65h 75/24
U.S. Cl. 242—72.1 8 Claims



A stationary spindle having rotatably attached to the periphery thereof a plurality of ribs extending longitudinally of the spindle, and an axially movable central shaft therethrough connected to an external power source. The ribs are adapted to expand radially with respect to the spindle between a first position spaced from a workpiece

mounted therearound and a second position in gripping relationship with the interior wall of the workpiece in response to an axial movement of said central shaft. A cam arrangement, including an axially slidable cam member and an axially stationary cam member, connects the central shaft with the ribs and adapts the ribs to properly align themselves as a result of the tension exerted by axial movement of the central shaft. An end plate attached to the nonrotating spindle bears against the rotating rib assembly in the contracted position, yet is spaced therefrom in the expanded position to selectively prevent and allow rotation thereof. The workpiece may be cylindrical, tapered, or conical shaped, requiring only a change in the ribs to adapt the spindle to receive such members.

3,637,157

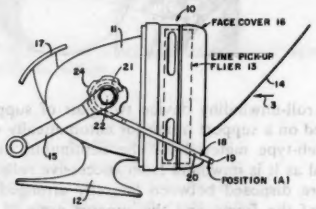
SPINNING REEL

Lacy A. Rowe, 1851 Skycoe Drive, Salem, Va.

Continuation-in-part of application Ser. No. 790,112, Jan. 9, 1969, now Patent No. 3,534,919. This application July 15, 1970, Ser. No. 54,928

Int. Cl. A01k *89/00*

U.S. Cl. 242—84.2 R **7 Claims**



A spinning reel for fishing lines, having a housing with a rotatable line pickup flier from the periphery of which the line extends generally in the direction of axis of rotation. An external yoke is pivoted to the housing for swinging movement from an inoperative position in which the bight portion of the yoke is outside the periphery of the flier and not engaged by the line, to an operative position wherein the yoke bight portion crosses the face of the flier and engages the line at an adjustable diametric distance from the inoperative position, so that oscillations of a selected amplitude are imparted to the line when the line is reeled in.

3,637,158

REELING APPARATUS FOR ARMY CABLE

Anrulv Moe Jacobsen, Lillehammer, Norway, assignor to A/S Norsk Kabelfabrik, Drammen, Norway

Filed Sept. 15, 1969, Ser. No. 857,704

Claims priority, application Norway, Sept. 19, 1968, 3701/68

Int. Cl. B65h *75/40*

U.S. Cl. 242—96 **3 Claims**

The specification discloses a reeling apparatus for army cable, comprising a reel rotatably mounted in a U-shaped frame, the yoke or bend of which carries a depending journal. The apparatus also comprises a supporting bracket rigidly carrying a sleeve and a supporting plate pivotally carrying a similar sleeve. The journal can be inserted into either sleeve, whereby the frame can be fastened alternatively to said bracket comprises fastening means for attachment to a vehicle, whereas the supporting plate is adapted to be fastened on the front of a person. Straps secured on the person are provided for suspending the frame when supported by the pivotally mounted sleeve on the supporting plate fastened on the front of the person.

3,637,159

AUTOMATIC CARRIER BOX LATCH OF REDUCED DIMENSIONS

Luigi Caramella, Zona Industriale Roccapretra, Varallo (Vercelli), Italy

Filed Sept. 23, 1969, Ser. No. 860,308

Claims priority, application Italy, Dec. 12, 1968, 24968 A/68

Int. Cl. B65h *75/48*

U.S. Cl. 242—107.3 **5 Claims**

An automatic latch device for suspended bodies, such as electric light pendants and the like, comprising: a spherical segment-shaped box symmetrical about a plane passing through the center, the two shells comprising said box meeting on said plane and, in addition to being effective as containers, said shells being internally shaped so as to form a seating for members comprising the mechanism and forming part of said members as well. Inside the shell is a cylindrical cup drum, the carrying cable being externally wound thereon, for internally containing a coil spring, a disc having a central pin adhering to said spring, and a clutch plate wherein suitable seatings are formed for the clamping members with said drum. A pin fast with the rear shell has a diametrical slit for coupling the inner end of the spring about which said drum idling rotates, as well as a transverse pin for deviating said carrying cable. Outside the front shell a screw with a resilient washer is arranged and screws down in the pin of the disc adjacent said clutch plate; and a suitably shaped element is also provided for anchoring at the bottom both said carrying cable and the helical driving cable.

3,637,160

APPARATUS FOR WITHDRAWING YARN FROM BOBBIN

Kikuo Hori, 2750-1, Minamiyoshida-machi, and Masakazu Fujita, 2901, Minamiyoshida-machi, both of Matsuyama-shi, Ehime-ken, Japan

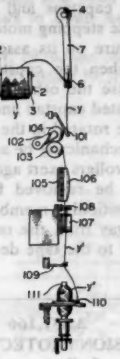
Filed May 12, 1970, Ser. No. 36,517

Claims priority, application Japan, May 17, 1969, 44/38220

Int. Cl. B65h *49/02;* **D02h** *1/00;* **D03j** *5/08*

U.S. Cl. 242—131 **6 Claims**

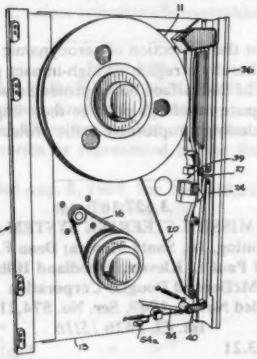
An apparatus for unwinding yarn from a bobbin supported in an outwardly projecting manner on a creel has a rotatable shaft disposed above the bobbin and spaced forwardly of the frame or backplate comprising the creel. An arm is provided having on one end an arm root rotatably mounted on the shaft and a yarn-guiding member on the other end substantially coaxial with and forwardly spaced from the bobbin. A

pair of flange plates is secured to the shaft closely adjacent to the sides of the arm root so as to resiliently and yieldably engage the arm root whereby the arm is rotatable with the shaft and is also rotatable independently on the shaft.

3,637,161

MAGNETIC TAPE TRANSPORT SYSTEM

Kenneth R. Baur, Halesite, and Robert W. Melhofer, Brookhaven, both of N.Y., assignors to Magnetic Recording Systems, Inc., Westbury, N.Y. and Infotec, Inc., Plainview, N.Y.

Filed May 12, 1970, Ser. No. 36,625
Int. Cl. B65h *59/38*; G03b *1/04*; G11b *15/32*
U.S. Cl. 242—186 **40 Claims**



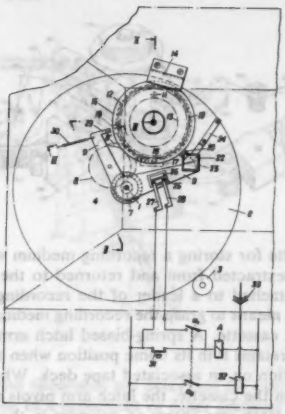
A tape transport system having a freely slidable carriage assembly to isolate the movement of a loop of tape under capstan control from the movement of the remainder of the tape under control of the reel motors. Sensing means are disposed adjacent the carriage assembly to continuously generate a signal in accordance with the position thereof. In normal forward mode or normal reverse mode, a capstan motor drives the tape within the loop past a magnetic head assembly in accordance with read or write speed requirements. A servocontrol system responsive to the carriage position signal regulates the speed of the reel motors so that the carriage tends to recenter. A fast rewind mode is also provided wherein the tape is rewound by the reel motors at a very high speed. In this mode a servocontrol system responsive to the carriage position signal regulates the speed of the capstan motor so that the carriage again tends to recenter. Additionally, means are provided to sense variations in the length of tape between the tape reels and the tape loop with the generated signal controlling the reel motor torques.

3,637,162

CINEMATOGRAPHIC TAKING OR REPRODUCING APPARATUS

Michael Drahonovsky, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed Sept. 25, 1969, Ser. No. 860,984
Claims priority, application Austria, Sept. 27, 1968, A 9472/68
Int. Cl. B65h *59/38*; G11b *1/52*, *15/06*
U.S. Cl. 242—188 **10 Claims**



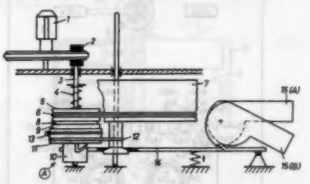
A reproducing apparatus for a striplike information carrier member drive means which is adapted to transport the carrier member alternatively in forward and reversed transporting direction. Metering means have an operating condition and a resting condition, in operating condition metering alternatively forwards and backwards according to the transporting direction. Connecting means are adapted to connect the drive means with the metering means to bring the latter in operating condition. Means are controlled by the metering means upon reaching a metering value to be predetermined and which comprise stop means adapted to stop the drive means.

3,637,163

ARRANGEMENT FOR THE TAPE-END SWITCH-OFF FOR MAGNETIC TAPE RECORDERS, IN PARTICULAR CASSETTE RECORDERS

Siegfried Apitz, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,290
Claims priority, application Germany, Apr. 9, 1969, P 19 18 097.3
Int. Cl. B65h *59/38*; G03b *1/02*; G11b *15/13*
U.S. Cl. 242—191 **3 Claims**

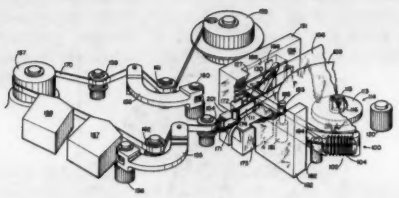


An arrangement is provided for the automatic tape-end switch-off for cassette recorders. Two rotary movements are developed in the recorder via the takeup spindle, pulleys and a flywheel mass. End of tape results in a change of direction of the first rotary movement with respect to the second. The change in direction is converted into either an axial or radial movement which effects switch-off.

3,637,164
CASSETTE FOR RECORDING MEDIUM

Edwin W. Trefzger, Ilion; Bruce Crimmins, Little Falls; Raymond A. Plunkett, Herkimer; Richard J. Petkovsek, and Leslie Phillip Finster, both of Ilion, all of N.Y., assignors to The Singer Company

Filed Mar. 23, 1970, Ser. No. 21,564
Int. Cl. G03b *1/04;* **G11b** *15/32*
U.S. Cl. 242—195 **9 Claims**

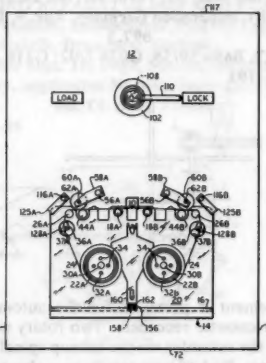


A cassette for storing a recording medium which may be selectively extracted from and returned to the cassette. An eyelet is attached to a leader of the recording medium for providing a means to grasp the recording medium and extract it from the cassette. A spring-biased latch arm clutches the eyelet and retains it in its home position when the cassette is not in position on an associated tape deck. When tape is extracted from the cassette, the latch arm pivots and an extension of the latch arm enters an aperture in the frame of the tape deck to inhibit removal of the cassette from the deck. The tape deck includes first and second sensors for sensing the presence or absence of first or second apertures in the cassette. One or more of the cassette apertures may be selectively blocked to provide information to the associated equipment indicative of selected characteristics of the cassette and/or of the recording medium contained therein. In addition to providing a latching function, the latch arm, in the pivoted position, may operate a switch indicative of the fact that recording medium has been extracted from the cassette.

3,637,165
TAPE DECK

William F. Rethwish, Bonita, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Dec. 12, 1969, Ser. No. 884,634
Int. Cl. G03b *1/04;* **G11b** *15/32, 23/04*
U.S. Cl. 242—199 **10 Claims**

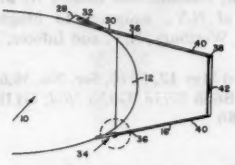


Tape deck for use with two-reel magnetic tape cartridge includes torque motors for tensioning tape extended between the reels of the cartridge and two capstans situated on opposite sides of a magnetic head and rotated by a stepping motor. In an operative mode of the apparatus, pinch rollers hold the tape against the capstans and control means operate synchronously with the stepping motor to cause one roller to exert increased pressure on its associated capstan and the tape therebetween when the capstans are rotated in one direction, and to cause the other roller to exert increased pressure on its associated capstan and the tape therebetween when the capstans are rotated in the opposite direction. The control means can mechanically be adjusted to vary the pressure which the pinch rollers exert against the tape. When the tape cartridge is to be removed from the tape deck, a manually operated positioning member moves the rollers and other components away from the tape and also electrically disconnects all power to the tape deck and releases the cartridge.

3,637,166
RAIN EROSION PROTECTIVE DEVICE

James E. Nicholson, Sudbury, and Richard H. Adams, Bedford, both of Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 699,465, Jan. 22, 1968, Pat. No. 3,524,608
Filed Aug. 17, 1970, Ser. No. 30,728
Int. Cl. B64d *45/00*
U.S. Cl. 244—1 R **3 Claims**

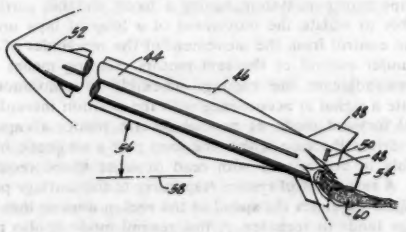


Apparatus for the protection of aerodynamic surfaces from rain erosion whereby a region of high-impact pressure air is trapped ahead of the surface being protected which is operative to disintegrate raindrops prior to their impact upon the surface and including a rupturable static protective means for said device.

3,637,167
MISSILE STEERING SYSTEM

Herman D. Froning, Jr., Santa Monica; Dean F. Hopkins, Los Angeles, and Paul L. Klevatt, Woodland Hills, all of Calif., assignors to McDonnell Douglas Corporation

Filed Nov. 5, 1969, Ser. No. 874,218
Int. Cl. F42b *15/16*
U.S. Cl. 244—3.21 **4 Claims**



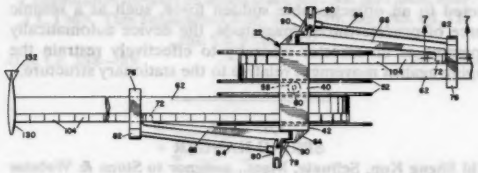
A missile steering system wherein high maneuverability of a missile is achieved by combined interaction of jet exhaust and movable fins on fluid flow past the missile surface. Jet exit ports are located between movable fins and selected ones are used in various steering maneuvers.

3,637,168

FLEXIBLE BLADE RETRACTABLE ROTOR AIRCRAFT

T. Claude Ryan, San Diego, and Peter F. Girard, La Mesa, both of Calif., assignors to Ryan Aeronautical Company, San Diego, Calif.

Filed Feb. 11, 1970, Ser. No. 10,388
Int. Cl. B64c 27/26
U.S. Cl. 244—7 A 9 Claims



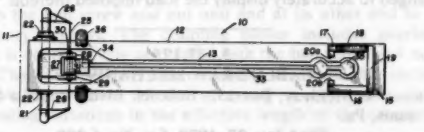
A compound helicopter-type aircraft with a fixed wing and forward propulsion means, and incorporating a rotor having flexible blades which are wound up on reels and enclosed in the aircraft when not in use. The blades are composed of flexible straps with segmented leading edge portions of airfoil shape, and flexible rear filler portions to complete the airfoil, the segmented portions being designed to prevent the strap from being stretched beyond its elastic limit. The rotor blades are synchronized in extension and retraction and controlled in accordance with rotational speed by an automatic brake means, which also causes retraction of the blades when power is shut off, unless intentionally overridden.

3,637,169

VARIABLE PARAMETER NUTATION DAMPER

Barry E. Tossman; Frederick F. Mobley, and Robert E. Fischell, all of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 8, 1969, Ser. No. 848,503
Int. Cl. B64g 1/00
U.S. Cl. 244—1 SA 5 Claims



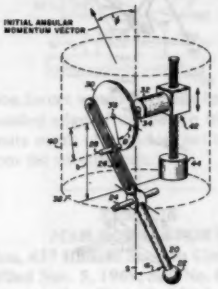
An end-weighted pendulum is suspended on a torsion wire which extends parallel to the spin axis of a spacecraft and restrains the pendulum to swing in a plane normal to the spin axis, if the spacecraft is nutating. The end of the pendulum is a vane member formed of electrically conductive, nonmagnetic material which swings between the pole faces of a magnetic structure and creates eddy-current losses within the vane member to dissipate the nutation energy. Means are provided for changing both the eddy-current damping coefficient and the mechanical resonance of the nutation damper structure so that the damper is effective in dissipating nutations at more than one spacecraft spin rate.

3,637,170

SPACECRAFT ATTITUDE CONTROL METHOD AND APPARATUS

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Thomas R. Kane, Stanford University, and Mark P. Scher, Palos Verdes Peninsula, both of Calif.

Filed Dec. 31, 1969, Ser. No. 889,551
Int. Cl. B64g 1/00
U.S. Cl. 244—1 SA 10 Claims



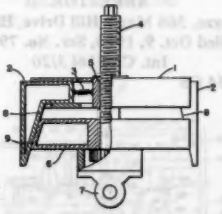
A method and apparatus are described for controlling the attitude motions of a spacecraft or other artificial body moving in space by causing certain components thereof to perform prescribed motions relative to one another so as to convert the initial motion of the spacecraft into one of simple rotation. The system includes a means for sensing the instantaneous motion of the body, means for computing the necessary relative motion between components to achieve the desired attitude motions, and means for physically implementing the required relative motion. The computing means may either be carried in the moving body or be remote and communicatively linked to the sensing and controlling apparatus.

3,637,171

APPARATUS FOR MOUNTING A VIBRATOR IN A FURNACE

Dietrich Kroeger, Wiesbaden, Germany, assignor to Jean Netter

Filed Oct. 24, 1969, Ser. No. 869,310
Claims priority, application Germany, Dec. 14, 1968, P 18 14 743.8
Int. Cl. F16m 13/00
U.S. Cl. 248—14 10 Claims

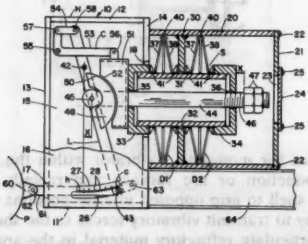


Apparatus for mounting a vibrator within the shell of an electric induction or arc furnace and radially expansible within the shell to grip opposed interior portions of the shell and thereby to transmit vibratory forces to the shell for compacting particulate refractory material in the annular space between the shell and the surrounding refractory wall of the furnace.

3,637,172
MUSIC STAND
Frederick B. Diesbach, Hamilton, Ohio, assignor to Krauth & Benninghofen, Inc., Hamilton, Ohio
Original application Jan. 6, 1968, Ser. No. 789,180, now abandoned. Divided and this application Jan. 29, 1970, Ser. No. 6,917
Int. Cl. A47b 97/04
U.S. Cl. 248—460 3 Claims

A music stand having quick release lock for engaging a tubular support member to a plate base member where the plate base member is disposed substantially perpendicular to the tubular support member comprising, in preferred form, (*a*) a circular hole in the plate member in which the tubular member is received, the hole being sized to provide slip fit when the plate member and tubular member are assembled and the hole having a first center that establishes a center axis perpendicular to the plate member, (*b*) at least two pins mounted to the plate on opposite sides of the hole, the pins being disposed on a circle having a second center with that second center being offset a small distance relative to the first center, (*c*) a lock ring rotatable relative to the plate member having a pair of opposed arcuate slots engaged with the pins, the arcuate slots having a common third center which lies on the same center axis as the second center, and (*d*) a hole in the lock ring that establishes a fourth center, the fourth center being offset the same small distance relative to the third center as the second center is offset from the first center so that as the lock ring is rotated relative to the plate member the fourth center can move from a release position where the fourth center also lies on the same center axis as the first center to a lock position where the fourth center is offset relative to the center axis of the first center.

3,637,173
SPRING-TYPE MECHANICAL SHOCK AND SWAY ARRESTOR
Leonard S. Suozzo, 366 Maple Hill Drive, Hackensack, N.J.
Filed Oct. 9, 1970, Ser. No. 79,559
Int. Cl. F16l 3/20
U.S. Cl. 248—54 CS 10 Claims

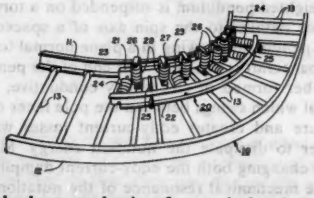


A device for use with equipment, such as piping, that is subject to changes in position due to variations in its thermal condition. The device includes a housing that is anchored to a stationary structure, a spring unit positioned within and engaging the housing, a rod extending through and engageable with the spring unit, a lever pivotally connected at spaced locations to the housing and to the rod, coupling mans pivotally connecting the lever to the piping, and camming means including a first cam member affixed to the lever and a second cam member interposed between the first cam member and the spring unit and coupled to the lever by a linkage. The parts are so constructed and arranged that the device permits normal movement of the piping due to said variations in thermal condition. In the event the piping is subjected to an objectionable sudden force, such as a seismic force of predetermined magnitude, the device automatically operates as an arrestor whereby to effectively restrain the piping against movement relative to the stationary structure.

3,637,174
SPRING HANGER
Chi Sheng Kuo, Scituate, Mass., assignor to Stone & Webster Engineering Corporation, Boston, Mass.
Filed Sept. 2, 1969, Ser. No. 854,709
Int. Cl. F16l 3/20
U.S. Cl. 248—54 17 Claims

Apparatus for suspending vertically disposed furnace tubes. A compression spring provided with spacers is arranged within a tubular casing having interior walls coated with a low-friction material to facilitate aligned compression of the spring. Calibrated load indicating means are also arranged to accurately display the load imposed thereon.

3,637,175
CABLE DRAW MECHANISM
James A. McElroy, Box 232, Babcock Blvd., Route #4, Gibsonia, Pa.
Filed Jan. 27, 1970, Ser. No. 6,200
Int. Cl. F16l 3/18
U.S. Cl. 248—55 4 Claims



A cable draw mechanism for use in bends in cable trays comprising a pair of spaced apart arcuate members, said

members being connected by spaced radial members at least a part of which carry rotatable thereon a plurality of independent rollers, a plurality of vertical standards on the radially innermost arcuate member, said standards carrying a plurality of rollers lying on an axis transverse to the spaced radial members.

3,637,176

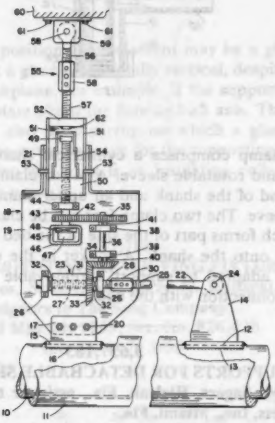
THERMOMECHANICAL MULTIFUNCTION SUPPORT DEVICE

Leonard S. Suozzo, 366 Maple Hill Drive, Hackensack, N.J.

Continuation-in-part of application Ser. No. 807,048, Mar. 13, 1969. This application Aug. 17, 1970, Ser. No. 64,321

Int. Cl. F16l *3/20*

U.S. Cl. 248—59 **16 Claims**



A device for use with piping or other equipment that is subject to changes in position due to variations in its thermal condition. The device comprises actuating means, which is secured to the piping at spaced first and second locations and is movable relative to the piping in response and in direct proportion to expansion or contraction resulting from said variations in thermal condition, and coupling means. The actuating means includes a rigid member connected at one end to the piping at the first location and a ball screw and nut unit connected to the piping at the second location and connected to the other end of the rigid member. The coupling means is variable in effective length and is connected at one end to the ball screw and nut unit and at its other end to a stationary support. The coupling means includes gearing which is cooperatively associated with the ball screw and nut unit. The parts are so constructed and arranged that increments of movement of the actuating means cause corresponding variations in the effective length of the coupling means.

3,637,177

SUPPORT STRUCTURE

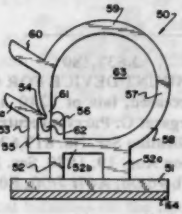
Kenneth E. Santucci, 9 N. Circle Ave., Boomingdale, Ill.

Continuation-in-part of application Ser. No. 748,004, July 26, 1968, now abandoned. This application Jan. 19, 1970, Ser. No. 3,817

Int. Cl. F16l *3/08*

U.S. Cl. 248—74 PB **9 Claims**

A unitary device designed to be secured to a substructure and to support and retain an object, such as a cable or the replaceable spindle for converting a standard record player spindle to accommodate records with odd-sized openings, for example, 45 r.p.m. record spindle openings. The supporting structure or device is designed to utilize a contact adhesive to bond or secure the device to a substructure and to utilize the structural features of the device to minimize the effects of deflection or jarring of the object retaining portion of the



unit. Deflection forces would normally have a tendency to lift a formerly bonded edge of the device from the substructure with the ultimate result of a gradual but total dislodgement of the device from the substructure.

3,637,178

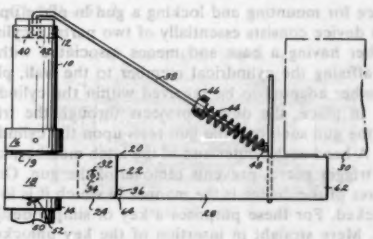
MAILBOX SUPPORT

John C. Golden, 437 Hudson St., Eau Claire, Wis.

Filed Nov. 5, 1969, Ser. No. 874,119

Int. Cl. A47g *29/12*

U.S. Cl. 248—145 **5 Claims**



A mailbox support having a generally upright post anchored in the ground and a mailbox support arm movably affixed to the post for movement in a lateral plane as well as in a vertical plane between a locked normal position and a locked servicing position. The mailbox support arm is freely movable in the lateral plane so that the support will not be damaged if the support arm is struck by a passing vehicle.

3,637,179

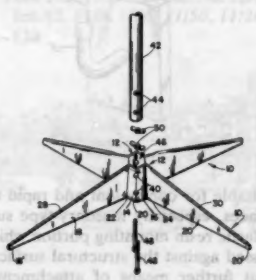
BASE PORTION OF A STAND OR THE LIKE

Howard J. Marschak, 865 W. North Ave., Chicago, Ill.

Filed Dec. 4, 1969, Ser. No. 882,227

Int. Cl. A47b *91/00*

U.S. Cl. 248—188.7 **9 Claims**



A base portion for a stand or the like comprising a plurality of leg sections, each section having a central portion with

a leg radiating from the central portion and with the central portion formed of a pair of walls which taper so that the width of the walls increases progressively from the top towards the bottom, said central walls when assembled with their counterparts forming a hub to support an upright therein and with the hub portion raised upwardly of the outer ends of the legs.

3,637,180

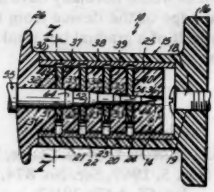
WALL MOUNT DEVICE FOR GUNS

Robert D. Parry, deceased, late of 7240 Algonquin, Cincinnati, Ohio (by Margaret G. Parry, executrix)

Continuation of application Ser. No. 817,630, Apr. 18, 1969. This application Aug. 19, 1970, Ser. No. 65,265

Int. Cl. A47b *96/06*; A47f *7/00*; E05b *73/00*

U.S. Cl. 248—203 **11 Claims**



A device for mounting and locking a gun in place upon a wall. The device consists essentially of two parts, a cylindrical member having a base and means associated with the base for affixing the cylindrical member to the wall, plus a latch member adapted to be received within the cylindrical member. In place, the device projects through the trigger guard of the gun such that the gun rests upon the cylindrical member. A head at the outer end of the latch member, larger than the trigger guard, prevents removal of the gun. One of the features of the device is the manner in which it is locked and unlocked. For these purposes a key of simple design is provided. Mere straight in insertion of the key unlocks the device, whereas mere straight out withdrawal of the key locks the device.

3,637,181

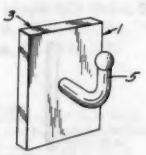
ADHESIVE FIXTURE

Edward W. Janssen, Roseville, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation-in-part of application Ser. No. 1,637, Jan. 9, 1970, now abandoned. This application Mar. 16, 1970, Ser. No. 19,768

Int. Cl. A47g *1/20*

U.S. Cl. 248—205 A **3 Claims**



A fixture suitable for convenient and rapid attachment to structural surfaces, especially masonry-type surfaces, which has a thermoplastic resin mounting portion which can be softened and pressed against the structural surface and bonded thereto without further means of attachment. The fixture may have a fuel adhered to the mounting portion which upon ignition by a flame will burn to soften the thermoplastic resin to a bonding state.

3,637,182

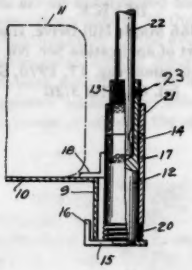
CLAMP FOR ATTACHMENT TO SIDE OF HOSPITAL BED

Ivan C. Bohlman, 208 North 2nd Ave., Box 1208, Walla Walla, Wash.

Filed May 25, 1970, Ser. No. 40,083

Int. Cl. A47g *9/00*

U.S. Cl. 248—226 B **1 Claim**



This clamp comprises a cylindrical shank on which is a slidable and rotatable sleeve. A lower clamp foot is secured to one end of the shank and an upper clamp foot is secured to the sleeve. The two clamp feet can be clamped onto a support which forms part of the side of the bed by a nut which is threaded onto the shank. A socket in the upper end of the shank is adapted to support a removable upright member used in connection with the bed.

3,637,183

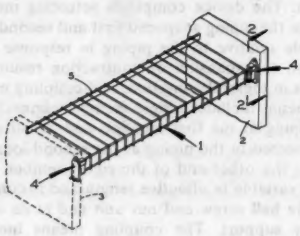
SUPPORTS FOR DETACHABLE SHELVING

Stanley M. Sagers, Hialeah, Fla., assignor to Advance Metal Products, Inc., Miami, Fla.

Filed Nov. 17, 1970, Ser. No. 90,367

Int. Cl. A47g *29/02*

U.S. Cl. 248—235 **5 Claims**



A support assembly secured to opposite parallel sidewalls for detachably securing a pair of each opposite end portions of horizontal end rods in vertical spaced relation for a detachable shelf.

3,637,184

EXTENSIBLE AND RETRACTABLE SUPPORT

Edward M. O'Brien, 1717 East Saint Louis Ave., Las Vegas, Nev.

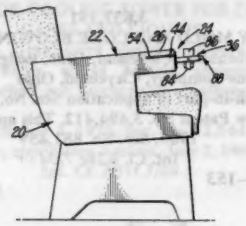
Filed Mar. 10, 1970, Ser. No. 18,189

Int. Cl. A47c *7/70*

U.S. Cl. 248—279 **6 Claims**

A shelflike supporting structure extensible into a generally horizontal operating position and retractable into a generally vertical position within a vertically oriented storage space within a housing, through a vertically oriented opening in the housing. The supporting structure is rotatable about a fore-

and-aft axis into its operating position after extension from the housing, and may remain free to rotate about this fore-and-aft axis, or it may be locked against such rotation. The supporting structure includes a supporting member having an element mounted thereon for pivotal movement about a pivot axis which is perpendicular to the fore-and-aft axis and which is generally horizontal when the supporting structure is



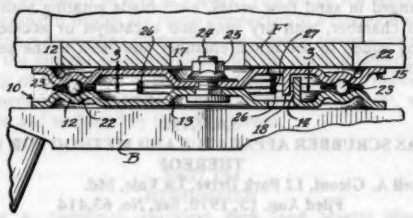
in its operating position. This element may be a gimbal ring which maintains a glass substantially vertical, despite attitude changes of an airplane, for example, if the supporting structure is free to rotate about the fore-and-aft axis. The element mentioned may also be a stirrup on which a glass may be seated, an ashtray cover, a brace for the supporting structure, and the like. Also disclosed is an insulating collar for supporting a glass in a ring.

3,637,185

SELF-ORIENTING REVOLVING FIXTURE

Aloysius J. Mikos, Skokie, and Jerzy K. Kubacki, Chicago, both of Ill., assignors to The Seng Company

Filed May 21, 1969, Ser. No. 826,426
Int. Cl. A47c *3/00*
U.S. Cl. 248—425 **9 Claims**



A self-orienting revolving fixture for furniture which is of the type having parallel plates relatively rotatable about a central axis with antifriction means between the plates, a coil spring that has at least one convolution surrounding said axis with means on the plates to stress the spring by pulling circumferentially in opposite directions on the ends of the spring, there being a guide finger positioned radially inwardly from the spring and substantially in contact with the spring convolution in oriented position, the guide finger restricting bodily shifting movement and preventing differential stressing of the spring during relative rotation of the plates.

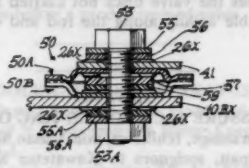
3,637,186

DETENT SWIVEL FOR TRUCK MIRRORS AND THE LIKE

Alec Greenfield, deceased, late of Chicago, Ill. (by Dorothy M. Greenfield, executrix), assignor to Avnet, Inc., New York, N.Y.

Filed Oct. 16, 1969, Ser. No. 867,105
Int. Cl. B60r *1/06*
U.S. Cl. 248—478 **12 Claims**

Relatively pivotable detent members for holding positions of adjustment in rearview truck mirrors and the like. The detent members may take the form of circular stamped plates having a central depression forming a well surrounded by a flange in which are troughlike detent formations adapted to nest in assembly and to snap into and out of interfit when the



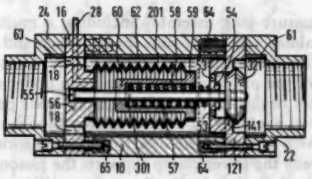
members are pivoted one relative to the other. Metal is removed in critical locations on the flange, as by formations of slots and perforations to impart a limited springiness to each flange portion or the detent formations or both.

3,637,187

VALVE WITH AXIALLY SPACED GUIDES AND BELLOWS OPERATOR

Manfred Burger, Munich, Germany, assignor to Daniel Stephen Delany, London, England, a part interest.

Filed Nov. 12, 1969, Ser. No. 876,018
Claims priority, application Germany, May 5, 1969, P 19 22 886.5
Int. Cl. F16k *31/145*, *41/10*
U.S. Cl. 251—61.3 **12 Claims**



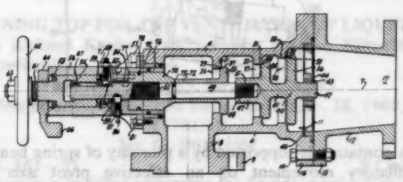
A valve having a straight tubular housing is provided with a transverse valve seat and a valve disc mounted on a stem having two axially spaced portions which are guided by elements fixed on the valve housing for precisely axial movement of the valve disc toward and away from the valve seat. The valve stem is moved by pressure fluid in bellows in one direction, and by a return spring and/or pressure of the controlled fluid in the other direction.

3,637,188

MULTISTAGE THROTTLE VALVE

Harry L. Ung, South San Francisco, Calif., assignor to Baldwin-Lima-Hamilton Corporation

Filed Jan. 13, 1970, Ser. No. 2,554
Int. Cl. F16k *1/06*, *31/50*, *11/20*
U.S. Cl. 251—120 **10 Claims**



A multistage throttle valve has a generally cylindrical housing with an inlet adjacent one end and an outlet at the other end. The interior of the housing is spanned by several, axially

spaced valve seat plates having coaxial apertures therethrough of progressively larger sizes toward the outlet. An axially movable operating rod passes axially through the apertures and carries at least one of several valve discs thereon. An operating tube is disposed around the operating rod and carries the valve discs not carried by the rod. The tube is movable axially along the rod and can be fastened thereto.

3,637,189

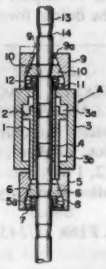
OIL PRESSURE JACK FOR LIFTING OPERATION

Hidekichi Murashige, Ichikawa, and Masao Simakura, Tokyo, both of Japan, assignors to Kawatetsu Kizai Kogyo Co. Ltd., Minato-ku, Tokyo, Japan

Filed May 26, 1970, Ser. No. 40,521

Int. Cl. B66f 7/12

U.S. Cl. 254—89 H **4 Claims**



An oil pressure jack assembly including a multiplicity of piston assemblies with guide rods therethrough and a support structure with interconnected dump valves for said guide rods. Each of the piston assemblies include upper and lower clamp holders having downwardly inclined inner peripheries, said guide rods each having a series of step shoulders matable with said clamp holders, both clamps including spring biasing means whereby the lower clamp supports the piston on a step of a guide rod during hydraulic action raising the upper clamp and vice versa.

3,637,190

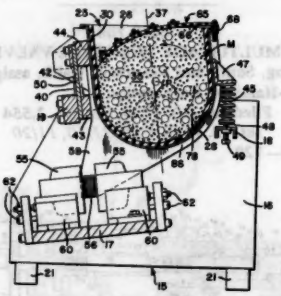
VIBRATORY APPARATUS

Max Isaacson, Dayton, Ohio, assignor to Vibrodyne, Inc., Dayton, Ohio

Filed Aug. 15, 1969, Ser. No. 850,496

Int. Cl. B01f 11/00

U.S. Cl. 259—72 **17 Claims**



A container is supported by a plurality of spring beams for oscillatory movement on an effective pivot axis offset laterally from a vertical center plane of the container, and a plurality of generally vertical coil springs cooperate with the spring beams to provide the container and the load therein with a resonant frequency of oscillation corresponding substantially to a predetermined excitation frequency. The coil springs are offset laterally from the vertical center plane of the container in spaced relation to the spring beams and are adjustable to provide for substantially maintaining the resonant frequency of oscillation with changes in the load. A cover member is positioned for exerting pressure on the load within the container and in one form is flexible with attached weights and in another form is substantially rigid and hinged to the container.

3,637,191

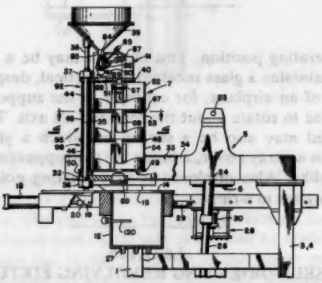
FOUNDRY MOLD AND CORE BLOWING MACHINE

Edward D. Abraham, Cleveland, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Continuation-in-part of application Ser. No. 626,782, Mar. 29, 1967, now Patent No. 3,494,412. This application Dec. 2, 1969, Ser. No. 881,459

Int. Cl. B28c 7/04

U.S. Cl. 259—153 **28 Claims**



A foundry mold or core blowing machine having an in situ sand-resin mixer operating in the cycle of the machine and positioned between the sand supply and the blow reservoir which mixer comprises a plurality of rotating mixing blades arranged in sand flow series, each blade rotating within its own chamber, with dry sand and a catalyst or accelerator being added to the initial chamber and resin to the second chamber.

3,637,192

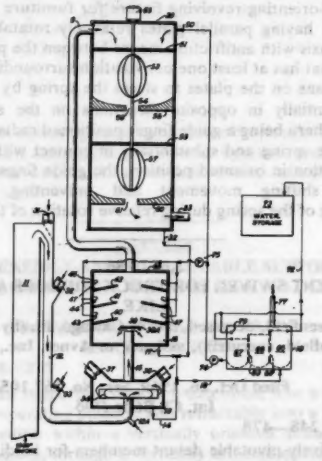
GAS SCRUBBER APPARATUS AND METHOD FOR USE THEREOF

Renell A. Giconi, 12 Park Drive, La Vale, Md.

Filed Aug. 13, 1970, Ser. No. 63,414

Int. Cl. B01d 47/06

U.S. Cl. 261—17 **14 Claims**



A gas scrubber for the effluent from smokestacks is widely distributed and intermixed with a water vapor mist followed

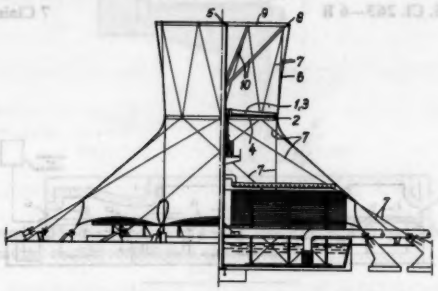
by agitation through ingenious watery beaters so that the water captures the solid particle constituents and captures the materials soluble in the water. The water after settling the particles therefrom may be recycled.

3,637,193

VENTILATOR-COOLING TOWER FOR COOLING GASES AND LIQUIDS

Manfred Kugler, Graz; Gerd Muller, Salzburg, and Gunter Schwarz, Dornbirn, all of Austria, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed July 2, 1970, Ser. No. 52,044
Claims priority, application Austria, July 2, 1969, A 6311/69
Int. Cl. B01f *3/04*
U.S. Cl. 261—24 **9 Claims**



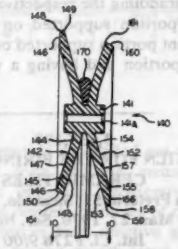
A ventilator-cooling tower of the round type for cooling gases and liquids in which the supporting framework comprises a cable construction and in which the bearing means for the ventilator as well as a spacer ring within the region of the ventilator blades are firmly connected to a common shaft forming a supporting element of the cooling tower construction, the airtight envelope means for the cooling tower consisting of a material, such as reinforced synthetic material, impregnated canvas, wood, metal or asbestos cement, supported and anchored by the cable means.

3,637,194

HUMIDIFIER

James A. Swimmer, Highland Park, and Martin Harris, Chicago, both of Ill., assignors to Berns Air King Corporation, Chicago, Ill.

Filed Dec. 22, 1969, Ser. No. 887,236
Int. Cl. B01f *3/04*
U.S. Cl. 261—29 **5 Claims**



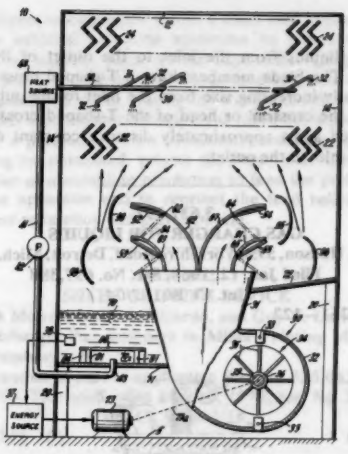
A humidifier comprises a housing formed from prefinished metal sheets in such a manner as to provide a water reservoir, an inclined filter pad carried by a water trough, an impeller disposed below the high point of the filter pad and consisting of a hub carrying a pair of axially spaced platelike bodies, each of the bodies having two semicircular water-throwing edges of different radii, a ring carried by the impeller and disposed partly in the water reservoir, a two-speed motor for rotating the impeller, and a combined shutoff and indicator apparatus which functions to show the amount of water left in the reservoir and to turn off the motor when the water level drops below a predetermined value.

3,637,195

COOLING TOWER APPARATUS

Benjamin V. Blazer, Paterson, and Mahmoud S. El-Tahry, Passaic, both of N.J., assignors to Blazer Corporation, East Rutherford, N.J.

Continuation-in-part of application Ser. No. 742,567, July 5, 1968, now Patent No. 3,494,109. This application Feb. 9, 1970, Ser. No. 9,794
Int. Cl. B01d *47/00*
U.S. Cl. 261—30 **12 Claims**



An improved modular cooling tower includes an air fan centrally located at the bottom of the tower, and a baffle vane and pivoted shutter arrangement disposed above the fan. The fan generates an airflow which passes through the baffles and vanes to react with a heated liquid flowing downward through the tower via a plurality of evaporating surfaces. The shutter structure is adapted to pass the fan generated airflow for cooling purposes while preventing the escape of fluid or vapor laden air from the tower fan orifice, thus obviating a potentially hazardous condensation condition.

In accordance with other aspects of the present invention, improved sump, fan and drive apparatus is provided to accommodate plural module installations.

3,637,196

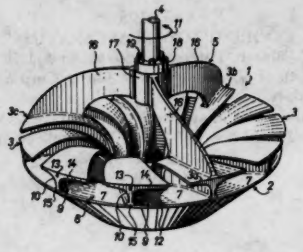
SPINNING TOP FOR THE VENTILATION OF LIQUIDS

Joseph Richard Kaelin, Villa Seeburg, Buochs, Nidwalden, Switzerland

Filed Nov. 28, 1969, Ser. No. 880,595
Claims priority, application Switzerland, Nov. 28, 1968, 17781/68
Int. Cl. B01f *3/04*
U.S. Cl. 261—91 **8 Claims**

An aerating impeller apparatus for liquids, particularly for purifying sewage, is formed of a rotor member or blade ring dependently secured from a rotatable vertically extending shaft. The rotor member extends upwardly from an inlet to an outlet and has an inner wall shaped arcuately in the radial direction joined along its upper and lower edges to an outer

frustoconically shaped wall so that an annular hollow space is formed between the two walls. A floatable material can be placed in the hollow space. A plurality of angularly spaced blade members are secured to and extend inwardly from the inner surface of the inner wall-forming conveyor ducts for



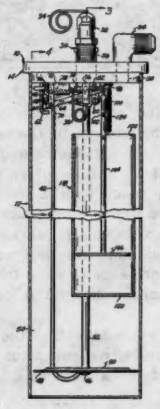
directing liquids from the inlet to the outlet of the rotor member. The blade members have a T-shaped cross section of generally increasing size from the inlet to the outlet. The edges of the crossrail or head of the T-shaped cross section are spaced apart approximately distance constant discance from the inlet to the outlet.

3,637,197

GAS CHARGER FOR LIQUIDS

James L. Hudson, 5950 Yorkshire Road, Detroit, Mich.

Filed Jan. 12, 1968, Ser. No. 697,388
Int. Cl. B01f *3/04*
U.S. Cl. 261—122 **4 Claims**



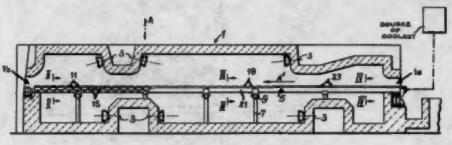
This device charges a liquid, such as water, with a gas, such as carbon dioxide, at low pressure, and consists of a gastight tank to the cover of which is attached a snap-action vent valve, a water inlet fixture, a charged-water outlet fixture, a gas inlet fixture, and a gas supply valve operated in one direction by vertical springs anchored to the cover and in the opposite direction by the varying weight of a cup of lightweight material located below the water inlet. The gas supply valve is connected to a porous gas diffuser located near the bottom of the tank. When a liquid, such as water, to be charged with gas is caused to flow into the tank, it first drops into the cup so as to cause its weight to lower the cup and overcome the force of the vertical springs. As the tank fills with water, the cup loses sufficient weight by Archimedes' principle to permit the vertical springs to simultaneously raise it and swing a yoke, which in turn causes a vent valve lever to snap over "dead center" to close the vent valve while opening the gas supply valve to permit gas to flow downward to the porous gas diffuser and thence to flow upward through the liquid so as to charge it with gas.

3,637,198

FURNACE FOR HEAT TREATING OF METALLIC WORKPIECES

Rudiger Knaak, Neuss, Germany, assignor to Koppers-Wistra-Ofenbau Gesellschaft mit beschrankter Haftung, Dusseldorf-Heerdt, Germany

Filed Jan. 12, 1970, Ser. No. 2,084
Int. Cl. F27b *9/14*
U.S. Cl. 263—6 B **7 Claims**



Wall means defines a chamber having an inlet and an outlet and including a first chamber section and a second chamber section which are respectively nearer to the inlet and to the outlet. Elongated tubular guide members extend through the chamber from the inlet towards the outlet for supporting metallic workpieces which are advanced from the former to the latter, each of these guide members having a longitudinally extending upwardly directed wall portion. Cooling means supplies internal cooling for the tubular guide members. Rows of wear-resistant first workpiece engaging elements are arranged in the first chamber section supported on and projecting upwardly from the respective wall portions by a predetermined height. Rows of second workpiece engaging elements are provided in the second member section supported on the respective wall portion and each comprises a holding portion straddling the respective wall portion, a thermally insulating portion supported on the holding portion and a heat-resistant portion supported on the associated thermally insulating portion and having a workpiece-contacting upper surface.

3,637,199

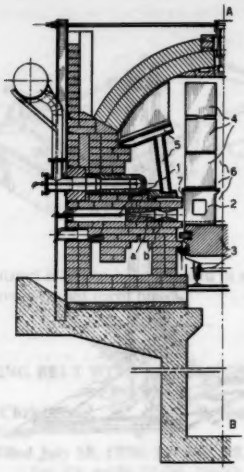
MUFFLE KILN FOR THE FIRING OF GLAZED CERAMIC TILES

Mauro Poppi, Via Pretorio 51, Sassuolo, Italy

Filed Mar. 27, 1970, Ser. No. 23,225
Int. Cl. F27b *9/00*
U.S. Cl. 263—28 **2 Claims**

A muffle tunnel kiln for the firing of glazed ceramic tiles. It is furnished with lateral burners ranged in opposed pairs blow the muffled combustion chambers in such a way that the flames and combustion gases of said burners develop and are dispersed along honeycombed blocks of refractory material placed on the specially lowered decks of kiln cars under a stack of tile trays. The tunnel is thus heated not only by the

usual muffled combustion chambers but also by the combustion gases of the lateral burners. The combustion gases



circulate inside the tunnel, unlike those of the burners which heat the muffle combustion chambers.

3,637,200

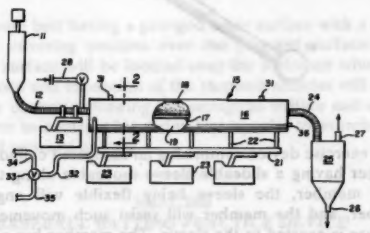
APPARATUS FOR GAS-SOLIDS REACTION IN PRODUCTION OF SULFUR, IRON AND RELATED PRODUCTS

Adolph Q. Lundquist, Golden, Colo., assignor to Hy-Met Engineering, Ltd., Denver, Colo.

Original application Jan. 16, 1968, Ser. No. 698,270, now Patent No. 3,549,351, dated Dec. 22, 1970. Divided and this application May 27, 1970, Ser. No. 40,762

Int. Cl. F27b *9/14*

U.S. Cl. 266—16 **4 Claims**



Apparatus for promoting controlled gas-solids reaction in elongated treatment zone utilizing means for producing vibratory action for impelling progressive movement of charge and separating discrete particles of charge in each increment of applied forces with reactive gas introduced in starvation amount at spaced points along course of movement entering spaced between separated particles. Impervious support surface of reaction zone provides controlled heat transfer during reaction and movement rate induced by vibratory action determines solids retention time in treatment zone. Treatment suitable for chlorination, sulfation, oxidation and reduction. Iron pyrites treatment for iron and elemental sulfur recovery at low cost.

3,637,201

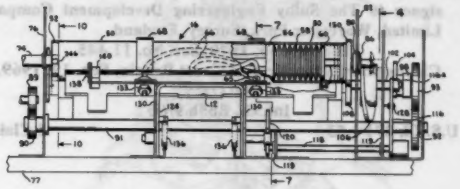
SHEET SEPARATION AND PREFEED APPARATUS

Ernst Schrempp, Norwalk, and Christian A. Beck, Ridgefield, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sept. 22, 1970, Ser. No. 74,364

Int. Cl. B65h *3/10*

U.S. Cl. 271—27 **25 Claims**



A bellows, incorporated within a sheet feed roller, is actuated by external actuating apparatus to create a partial vacuum at suction ports in the feed roller periphery. A pivotal pressure pad assembly momentarily presses a sheet stack against the ports, leaving the top sheet adhered to the feed roller which is then rotated to advance the separated top sheet to a prefeed position. Additional actuating apparatus, operating on command, rotates the feed roller through the remainder of a complete revolution to feed the prefed sheet from the apparatus and to reorient the feed roller for the next sheet separation and prefeed cycle.

3,637,202

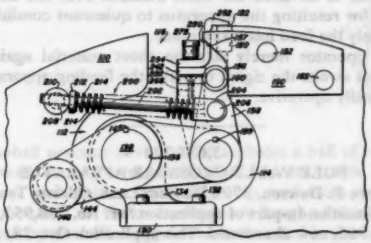
SHEET-GRIPPING DEVICE

Harry E. Mowry; Louis A. Ricardo, and Guy V. Carricato, all of Pittsburgh, Pa., assignors to Miller Printing Machinery Co., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 835,062, June 20, 1969. This application May 14, 1970, Ser. No. 37,130

Int. Cl. B65h *5/14*

U.S. Cl. 271—51 **8 Claims**



A sheet-gripping device includes a gripper assembly nonrotatably mounted on a gripper shaft. A link member rotatably supports the gripper shaft adjacent one end and is nonrotatably secured to an intermediate shaft adjacent the other end. A first cam follower lever is connected to the intermediate shaft and is arranged to oscillate the end of the link member supporting the gripper shaft. A second cam follower lever is nonrotatably connected to the gripper shaft and has a cam roller urged into abutting relation with a cam surface fixed on the cylinder. Movement of the link member by the first cam follower moves the gripper along a path similar to the cam surface against which the cam roller on the second cam follower is urged. The configuration of the cam members determines the path followed by the gripper assembly. The gripper assembly includes a lever with one end

secured to the gripper shaft and a recessed portion in the other end. A gripper member has a gripper finger at one end and an oppositely extending connecting portion at the other end. A connecting member connects the connecting portion to the lever and a resilient member urges the gripper finger toward the lever member.

3,637,203

APPARATUS FOR FEEDING SHEET MATERIAL

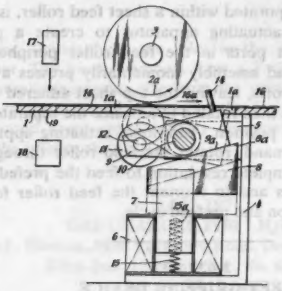
Lionel John Bryant Rushent French, London, England, assignor to The Sulby Engineering Development Company Limited, Worcester Park, Surrey, England

Filed Feb. 16, 1970, Ser. No. 11,445

Claims priority, application Great Britain, Feb. 19, 1969, 9,027/69

Int. Cl. B65h *9/06*

U.S. Cl. 271—53 **3 Claims**



Apparatus for intermittently feeding sheet material over a table which is automatically arrested by a stop projecting through the table in the path of the sheet material, and at the moment of freeing the sheet material the stop is retracted, and the feeding mechanism automatically brought into operation to advance the sheet material over the stop, and means for resetting the apparatus to quiescent condition immediately the feed has taken place.

The operator merely sets the sheet material against the stop and awaits the signal to make the feeding apparatus automatically operative.

3,637,204

POLE VAULT CROSSBAR APPARATUS

Theodore R. Dawson, 3794 Blossom Lane, Odessa, Tex.

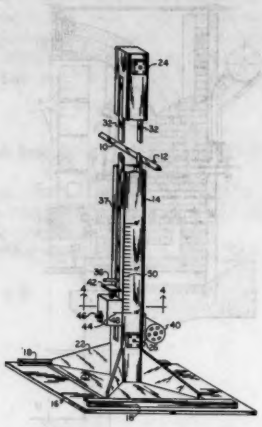
Continuation-in-part of application Ser. No. 738,952, June 21, 1968, now abandoned. This application Oct. 28, 1970, Ser. No. 84,820

Int. Cl. A63b *5/02, 5/16*

U.S. Cl. 272—59 C **16 Claims**

A crossbar for pole vaulting is placed on pegs mounted for vertical travel on two standards. The pegs are moved upward by halyards attached to the pegs and run over wheels at the top of the standards or downward by downhauls attached to the pegs. Therefore, the crossbar may be replaced when the pegs are at a height which is conveniently reached by attendants. The pegs and the crossbar are then raised to the desired height and stopped when protuberances on the halyards engage adjustable stops on the standards.

For automatic operation, an electrically conductive crossbar for pole vaulting is set upon pegs which are mounted for vertical travel on the two standards. If the bar is knocked off, the change in electrical resistance between the pegs is noted and the pegs run down the standards so the crossbar is manually replaced on the pegs at which time the change in electrical resistance between pegs cause the pegs to be run



up the standards. The height the pegs reach on the standard is adjusted by a limit switch on the standard.

3,637,205

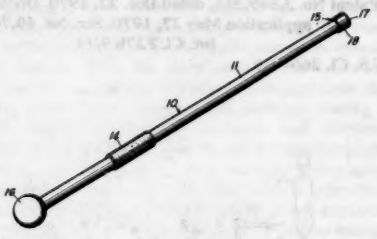
HAND EXERCISING AND FRICTIONAL RESISTANT-TYPE EXERCISING DEVICE

Parker J. Bankston, 2490A Skyland Drive N.E., Atlanta, Ga.

Filed July 9, 1970, Ser. No. 53,597

Int. Cl. A63b *21/30, 21/00*

U.S. Cl. 272—68 **12 Claims**



An exercise device comprising an elongated cylindrical bar member having a slideable sleeve moveable along the elongated member, the sleeve being flexible will engage the member, and the member will resist such movement when pressure is exerted to the sleeve. The member has a resilient spherical gripping element secured to one end, and a ferrule at the other. By various manipulations with the bar member, the user is able to exercise various body muscles.

3,637,206

ENDLESS BELT EXERCISER WITH ACCELERATING AND DECELERATING TREAD SURFACES

Kenton Chickering, III, 5513 Lincrest Ln., Houston, Tex.

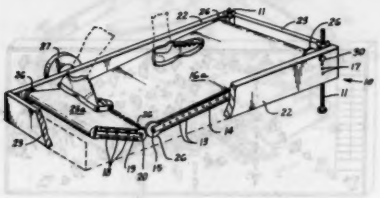
Filed Mar. 16, 1970, Ser. No. 19,792

Int. Cl. A63b *23/06*

U.S. Cl. 272—69 **7 Claims**

This disclosure relates to a new type of treadmill exercising device having a base, rollers carried by the base, and an endless belt disposed about the rollers to provide a tread sur-

face. The tread surface inclines upward toward each end to provide a forward accelerating area and a rear decelerating



area. This abstract is not to be construed in any way to define or limit the invention set forth below.

3,637,207

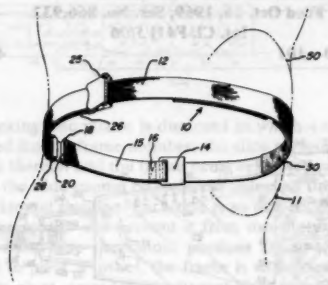
EXERCISING BELT WITH MUSCLE STIMULATING PRONGS

Chester W. Christensen, Jr., 1770 Bryant Ave. S., Minneapolis, Minn.

Filed July 28, 1970, Ser. No. 58,926

Int. Cl. A63b *21/26, 23/02*

U.S. Cl. 272—80 **10 Claims**



A posture belt having a pronged inner surface with a compressible covering position over the pronged surface. The pronged surface will be located over the abdomen when the belt is worn and expansion of the stomach muscles will compress the covering allowing the prongs to irritate and signal the wearer to contract his abdominal muscles to exercise the same and improve posture.

3,637,208

BASEBALL BATTING PRACTICE DEVICE

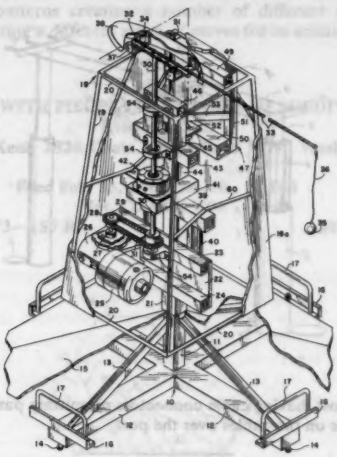
Aubrey M. Allred, 7320 Oakland Ln., Fort Worth, Tex.

Filed May 1, 1970, Ser. No. 33,810

Int. Cl. A63b *69/40*

U.S. Cl. 273—26 E **6 Claims**

A baseball practice device including vertical shafts, one above the other, and a friction clutch therebetween. A lateral arm on the upper shaft supports a ball on a cord on the extending end of the arm and the lower shaft is driven by a variable speed reversible electric motor. All of the named parts are mounted in a vertically movable frame. The frame does not turn, but there is a reversible motor and screw mechanism, also carried by the frame, which selectively adjusts the height of the latter and consequently the height of the arm. Preferably, the arm supporting the cord and ball is flexible; thus, the speed of the first-mentioned motor, by centrifugal force, determines the height of the ball from the ground. The two motors are driven at the same time from remote controls; thus, a batter does not know the elevation



or speed of the ball when he swings a bat and tries to hit the ball as it approaches him.

3,637,209

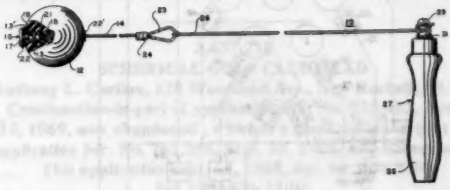
TETHERED BALL BASEBALL PRACTICE DEVICE

Earle J. Raut, Park Hills, Covington, Ky.

Continuation-in-part of application Ser. No. 793,698, Jan. 24, 1969, now abandoned. This application Aug. 14, 1969, Ser. No. 849,965

Int. Cl. A63d *15/10*

U.S. Cl. 273—26 E **6 Claims**



A baseball practice device which includes a ball of rubberlike material having a transverse bore, a metal cable length having an end portion extending into said bore, and an anchor mounted on the end portion. A flange of the anchor is engaged by the ball. A rigid tube is mounted in the bore. A cord is attached at one end of the cable remote from the anchor, and the cord, cable, and ball are swingable around an operator to give orbital motion to the ball.

3,637,210

CONVEYOR FOR FOOTBALL TACKLING DUMMIES

Ellard H. Brantley, 2301 Racine, Monroe, La.

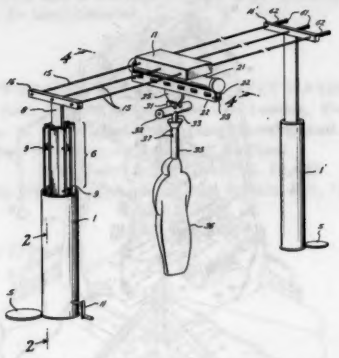
Filed Feb. 6, 1970, Ser. No. 9,170

Int. Cl. A63d *1/00*

U.S. Cl. 273—55 R **5 Claims**

A device for conveying objects from one point to another, such as for conveying football practice dummies, may be yieldably suspended from a track or cable, and may yieldable, movable target, as the carriage carries the dummy longitudinally on the cables, one end of the cables may be selectively altered, as well as yieldably maintained at a preselected plane. A modification of the device providing means for

transporting a carriage over an extended area, providing posts intermediate of the vertical adjustable post and the



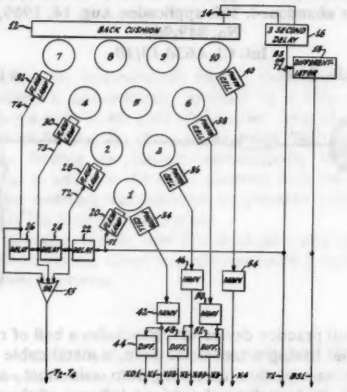
fixed post, having cable connectors permitting passage of the carriage on the cables over the post.

3,637,211

BOWLING SPLIT DETECTOR

Walter A. Helbig, Woodland Hills, Calif., and William E. Woods, Natick, Mass., assignors to RCA Corporation

Filed Oct. 19, 1965, Ser. No. 497,880
Int. Cl. A63d *5/04*
U.S. Cl. 273—54 C 7 Claims



A bowling "split" indicator in which signals are provided to indicate which pins are still standing after the first ball is rolled, and in which means are provided to determine whether the formation of the standing pins comprises a split, and to indicate the appearance of a split, and to disable the indicator if the headpin is still standing.

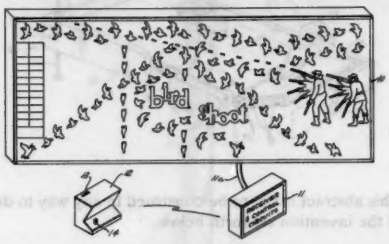
3,637,212

BIRD SHOOT GAME AND THE LIKE

Frederick A. Hurley, Miami, Fla., assignor to Funtronics, Inc., Miami, Fla.

Filed Mar. 24, 1969, Ser. No. 809,607
Int. Cl. A63f *9/02*
U.S. Cl. 273—85 R 4 Claims

An electric amusement game is provided having a panel with a plurality of rows of lights which when illuminated in sequence simulate the flight path of a bird. A different stepping switch is connected to the lights in each row to cause sequential illumination to indicate the flight of a bird and to simulate the path of a bullet in response to actuation of the stepping switches by players of the amusement game.



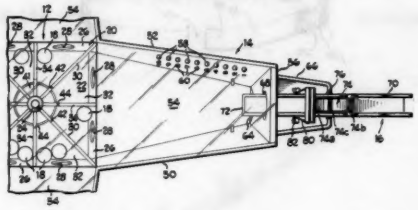
When the bullet intercepts the path of a bird, the panel provides indication of a falling bird and scores the number of birds which are brought down by each player of the amusement game.

3,637,213

SHOOTING GALLERY HAVING SEPARATE TARGETS HOUSED IN A CENTRAL SECTION

Jeffrey D. Breslow, and Marvin I. Glass, both of Chicago, Ill., assignors to Marvin Glass & Associates

Filed Oct. 16, 1969, Ser. No. 866,932
Int. Cl. F41j *5/06*
U.S. Cl. 273—101 4 Claims



A shooting gallery-type toy characterized by the provision of a plurality of firing lanes radiating from the central target area with the target area constructed to automatically return projectiles to the respective firing lanes from which the projectiles emanated upon release of a restraining member following discharge of the projectiles from all of the simulated weapons.

3,637,214

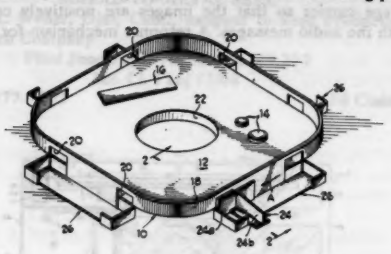
DISK GAME HAVING MOVEABLE GATE MEANS TO BLOCK TARGET OPENINGS

Marvin I. Glass, and Jeffrey D. Breslow, both of Chicago, Ill., assignors to Marvin Glass & Associates

Filed Nov. 17, 1969, Ser. No. 877,374
Int. Cl. A63b *63/00*
U.S. Cl. 273—126 R 3 Claims

A skill-type game having a generally flat, horizontal playing surface over which an object is propelled by one player toward a pair of spaced-apart "home" or receiving positions on the base support along one edge of the playing surface. A manually held and movable gate member is operable by a second player for blocking the receiving positions but permitting only one position to be blocked at any one time. The first player propels the object toward the receiving positions in an attempt to cause the object to enter one or the other of

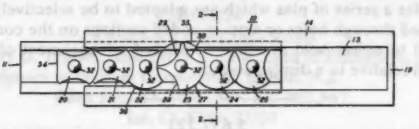
the receiving positions while the second player moves the gate member to block one or the other of the receiving positions in an attempt to prevent the object from entering either of the receiving positions.



3,637,215
LOCKING DISC PUZZLE

William Keister, 66 Baltusrol Way, Short Hills, N.J.

Filed Dec. 22, 1970, Ser. No. 100,559
Int. Cl. A63f 9/08
U.S. Cl. 273—155 9 Claims

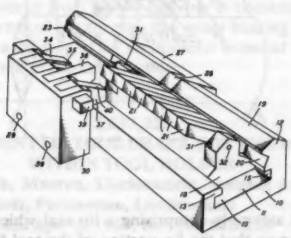


A locking disc puzzle is disclosed in which a slide is to be removed from a frame member, the slide carrying a plurality of discs thereon and the frame being restricted at its one end so that the slide cannot be removed unless all the discs are in the horizontal position. Each disc is so shaped, however, that an adjacent disc can prevent it from moving unless the adjacent discs have the cutout portions facing the disc it is desired to pivot. Further, the frame is so formed that a disc can only pivot, provided its adjacent discs permit, if that disc is positioned at a cutout portion in the frame upper side rail. The slide is removed by following an iterative pattern of disc rotations or moves which allows all the discs to be placed in the horizontal position.

3,637,216
PATTERN-MATCHING PUZZLE

William Keister, 66 Baltusrol Way, Short Hills, N.J.

Filed Dec. 11, 1970, Ser. No. 97,099
Int. Cl. A63f 9/08
U.S. Cl. 273—156 14 Claims

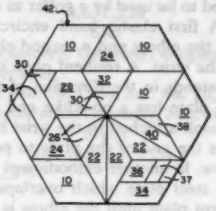


A pattern matching game is disclosed in which a slide-carrying teeter bars has to be removed from a frame by selectively pivoting individual ones of the teeter bars through a gate element in one rail of the frame. A series of pattern bars carried by a support or rack adjacent the frame member prevent opening of the gate element unless the position of the teeter bar adjacent each pattern bar matches the pattern bars. The pattern bars may be removed and rearranged in different patterns creating a number of different puzzles, each requiring a different series of moves for its solution.

3,637,217
PUZZLE WITH PIECES IN THE FORM OF SUBDIVIDED RHOMBUSES

Sherman Kent, 2824 Chain Bridge Road N.W., Washington, D.C.

Filed Feb. 13, 1970, Ser. No. 11,143
Int. Cl. A63f 9/06
U.S. Cl. 273—157 R 20 Claims

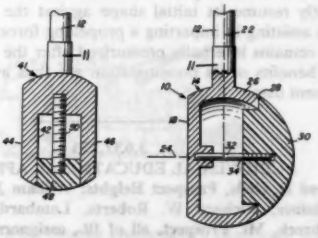


An educational puzzle made up of a plurality of blocks or puzzle pieces having the shapes of a rhombus and forms generated by dividing the rhombus. Puzzles can be formed having, for example, a hexagonal shape utilizing various combinations of the pieces. A hexagonal container can hold a plurality of puzzles of varying complexity which can then be assembled within the container so that unless each puzzle is properly assembled, the last puzzle cannot be assembled.

3,637,218
SPHERICAL GOLF CLUB HEAD

Anthony L. Carlino, 138 Woodland Ave., New Rochelle, N.Y.

Continuation-in-part of application Ser. No. 825,093, Apr. 14, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 761,256, Sept. 20, 1968, now abandoned. This application Sept. 11, 1969, Ser. No. 864,930
Int. Cl. A63b 53/04
U.S. Cl. 273—168 7 Claims



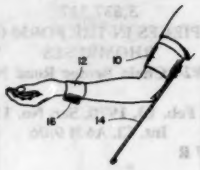
An instrument to accurately propel a golf ball comprising a shaft and a generally spherical body having at least one flat striking surface wherein the loci of the radii of said spherical body is at its center of gravity.

3,637,219

QUICK RELEASE ARM STRAIGHTENER DEVICE

George E. Lemon, 286 Lora Ave, Youngstown, Ohio

Filed Aug. 13, 1970, Ser. No. 63,402
Int. Cl. A63b 69/36
U.S. Cl. 273—189 A 8 Claims



A device for preventing or restraining the bending of an elbow. It is designed to be used by a golfer as an aid in improving his swing. A first elastic band encircles the arm immediately above the elbow and a second elastic band encircles the arm at the wrist. A resilient plate is attached to the first band and extends in the direction of the wrist. In one embodiment the plate has a hooklike end which engages a complimentary hook attached to the wrist band. Rotation of the wrist releases the end of the plate to permit free movement of the elbow. In another embodiment the wrist band is provided with a steel plate which overlaps and retains the end of the resilient plate until the elbow is bent a predetermined amount.

3,637,220

GOLF BALL

Thomas E. Fraley, 1040 Cathcart St., Jacksonville, Fla.

Filed Oct. 30, 1968, Ser. No. 771,912
Int. Cl. A63b 67/02, 67/06
U.S. Cl. 273—214 6 Claims

A game ball such as a baseball, tennis ball or golf ball containing an impact-responsive explosive charge. Upon being struck by a bat, racket or club, the ball is somewhat deformed and the impact energizes the explosive charge which instantaneously generates internal pressure within the ball. The internal pressure causes the deformed ball to instantly resume its initial shape against the impacting club, thus assisting in imparting a propelling force to the ball. The ball remains internally pressurized after the first impact and the benefits of its pressurization are thus available for subsequent uses.

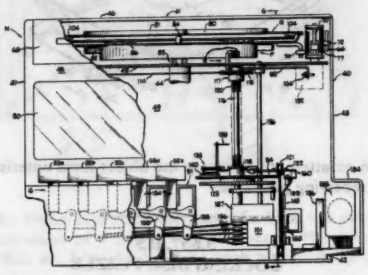
3,637,221

AUDIOVISUAL EDUCATIONAL APPARATUS

Alfred E. Geils, Prospect Heights; William J. Raymond, Des Plaines; Richard W. Roberts, Lombard, and Peter K. Shreck, Mt. Prospect, all of Ill., assignors to Bay-Warner Corporation, Chicago, Ill.

Original application Feb. 13, 1967, Ser. No. 615,547, now Pat. No. 3,483,633. Divided and this application Oct. 8, 1969, Ser. No. 871,153
Int. Cl. G11b 17/00
U.S. Cl. 274—9 R 3 Claims

An audiovisual educational apparatus employing a disc record having audio messages recorded in spaced relationship and film strips mounted on an image carrier. The movement of a tone arm is synchronized with the position of the image carrier so that the images are positively correlated with the audio messages. A response mechanism for registering choices to the questions and/or instructions presented includes a series of pins which are adapted to be selectively inserted through holes or slots in coded sections on the control card to either hold or allow controlled advancement of the card relative to a display station.

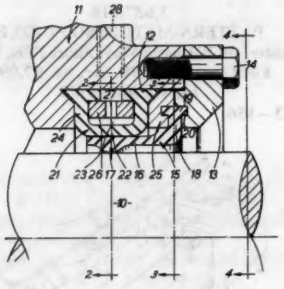


3,637,222

SEALS

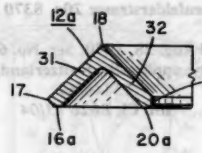
Samuel Clifford Walter Wilkinson, Cookham, England, assignor to Crane Packing Limited, Slough, Buckinghamshire, England

Filed Jan. 27, 1970, Ser. No. 6,141
Claims priority, application Great Britain, Feb. 5, 1969, 6,116/69
Int. Cl. F16j 15/46
U.S. Cl. 277—34 5 Claims



In a seal assembly comprising a lip seal which is mounted in a housing so that the lip portion of the seal for contacting a rotatable member is free to flex, the lip portion is urged into contact with the rotating member by a force applied through an annular inflatable member filled with a fluid under a pressure that may be varied to alter the applied force.

3,637,223
METAL-TO-METAL SEAL
Ronald A. Weber, Ojai, Calif., assignor to Esso Production Research Company
Filed June 12, 1970, Ser. No. 49,212
Int. Cl. F16j *15/08*
U.S. Cl. 277—205 10 Claims



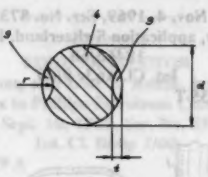
A V-shaped deformable metallic seal is retained in a groove formed in a flat face on one metallic joining section and effects a seal against a flat face on an opposing metallic joining section when these sections are brought together by suitable means.

3,637,224
ANNULAR SEALING RING
Robert D. Triplett, and Terry J. Laue, both of Effingham, Ill., assignors to Fedders Corporation, Edison, N.J.
Filed Feb. 27, 1969, Ser. No. 802,847
Int. Cl. F26b *25/08*
U.S. Cl. 277—229 6 Claims

An annular sealing ring which is adapted to provide an air-tight seal between relatively rotatable opposed concentric surfaces. The ring comprises a strip of laminated material which is folded longitudinally upon itself to provide a substantially "teardrop" cross-sectional configuration. The tubular portion of the ring at the forward end of the "teardrop" is adapted to resiliently engage one of the concentric surfaces, while the rear portion of the "teardrop" is adapted to be permanently secured to the other concentric surface. The laminated material from which the ring is constructed comprises a substrate of felt forming the outer bearing surface of the ring, and a coating of an elastomeric material bonded to the inner surface of the felt substrate.

3,637,225
ARRANGEMENT OF TOOL SHANK FOR ENGAGEMENT WITHIN TOOL HOLDER
Peter Schmuck, Mauren, Liechtenstein, assignor to Hilti Aktiengesellschaft, Furstentum, Liechtenstein
Filed Apr. 3, 1969, Ser. No. 813,256
Claims priority, application Germany, Apr. 10, 1968, P 17 52 155.0
Int. Cl. B23b *31/10*
U.S. Cl. 279—81 3 Claims

In a tool to be secured within a toolholder by means of cylindrical locking elements engaged within a groove in the shank of the tool, the optimum dimensions of the groove are based on the correlation of the size of the groove with the

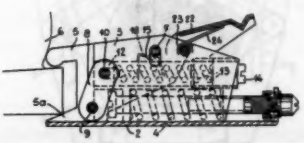


dimensions of the locking elements and the diameter of the shank.

3,637,226
SKI
Peter Simon, Schramberg, Germany, assignor to Karl Simon, Schramberg, Germany
Filed Feb. 10, 1970, Ser. No. 10,203
Claims priority, application Germany, Feb. 10, 1969, P 19 06 576.0
Int. Cl. A63c *5/04*
U.S. Cl. 280—11.13 V 9 Claims

A ski structure wherein the longitudinal edge strips are formed, at least in part, of a plurality of short-length elements made of a hard material.

3,637,227
REAR STOP FOR SKI BINDING
Rene Ramillon, 3, rue Emile Zola, Grenoble, Isere, France
Filed Jan. 27, 1970, Ser. No. 6,218
Claims priority, application France, Feb. 28, 1969, 6905513
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 4 Claims



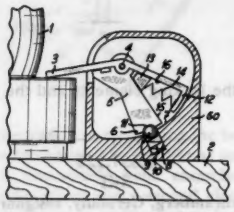
A rear stop for a ski binding comprising a stop body, a jaw, a link pivotally connected to the jaw, a pin hingedly interconnecting said body and said link, said pin passing through an elongated slot in the body, a spring urging the pin toward the front of the slot, a second pin carried by the jaw and passing through a slot in the body that has an upper end and a lower end, a retractable member holding the second pin in the upper end, and means to retract the retractable member thereby to open the rear stop.

3,637,228

SAFETY BINDING DEVICE FOR A BOOT ON A SKI

Georges Pierre Joseph Salomon, Avenue de Loverchy, 34 Annecy, France

Filed Nov. 4, 1969, Ser. No. 873,992
Claims priority, application Switzerland, Dec. 10, 1968, 18463/68
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 9 Claims



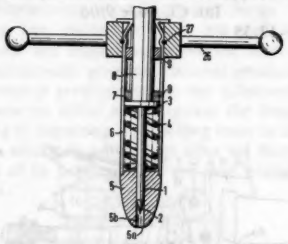
A safety binding device for a boot on a ski has a jaw to hold the sole of the boot against the ski elastically. A latch controlled by an elastic element limits the maximum force supportable by the jaw before it is unlatched to release the boot. The device has at least one ramp against which a friction member is elastically supported to absorb a certain energy whose level increases simultaneously with the increase in the displacement of the jaw before the force exerted by the boot reaches the unlatching value of the elastically controlled latch. A roller or ball is arranged to come into action at the unlatching value of the force, thereby eliminating the action of the friction member. The ramps may be straight or curved. The friction member can be a ball, roller or sliding wedge. Manual release and resetting levers may be incorporated.

3,637,229

SKI POLE

Ernst Klemm, 16-18, Lautenbacher Strasse, 7562 Gernsbach, Germany

Filed July 27, 1970, Ser. No. 58,596
Claims priority, application Germany, Aug. 5, 1969, P 19 39 802.8
Int. Cl. A63c 11/22
U.S. Cl. 280—11.37 P 7 Claims



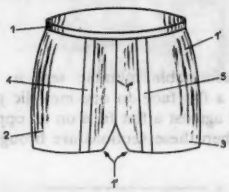
A spike assembly for attachment to a ski pole or walking stick adapted to provide secure support on hard or icy ground surfaces is presented. The assembly includes a profiled sleeve member longitudinally movably connected to the lower end of the shaft of a ski pole or the lower end of a walking stick in resilient engagement therewith. At least one guiding ring is positioned in the interior of the sleeve member and surrounds said shaft adjacent its lower end and a nail-shaped spike member is movable relative to the said sleeve member and is adapted to be shifted from a position wherein it is completely covered by the terminal portion of said sleeve member to a position wherein it protrudes beyond the terminal portion so that said sleeve member normally covers said spike until said shaft is under a downward load, at which time said sleeve retracts, allowing said spike to protrude from said sleeve member to provide support for the ski pole or walking stick.

3,637,230

SPORTING GOODS ITEM FOR WINTER SPORTS USE

Franz Polk, Frauenfelderstrasse 20a, 8370 Sirnach, Thurgau, Switzerland

Filed Aug. 28, 1970, Ser. No. 67,852
Claims priority, application Switzerland, Sept. 3, 1969, 13446/69
Int. Cl. B62b 13/04
U.S. Cl. 280—12 17 Claims



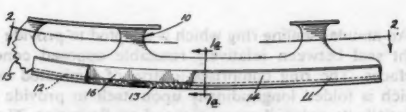
A pair of pants, either short or long legged, is made of synthetic plastic material and provided on its seat with one or two guide ribs extending lengthwise of the legs so that a wearer may sit with these pants on snow and slide over the snow, influencing his direction of movement by means of the guide ribs.

3,637,231

ICE SKATE EDGE GUARD

Russell A. Weidenbacker, 32 South Wyoming Ave., Box 153, Haverford, Pa.

Filed Aug. 4, 1970, Ser. No. 60,863
Int. Cl. A63c 3/12
U.S. Cl. 280—11.38 3 Claims

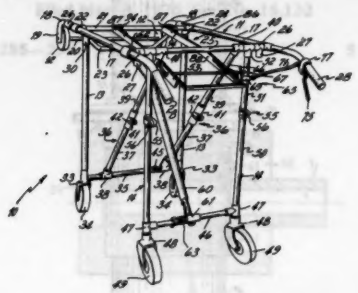


A removable guard for protecting the edge of an ice skate runner during periods of nonskating is adapted to be mounted on the skate by means of friction, magnetism or a combination of these forces. The guard has a narrow longitudinal slot for receiving the runner with a bottom wall which extends along substantially the entire length of the runner-edge and closely spaced upstanding sidewalls which may be biased toward one another to frictionally engage the sides of the runner for mounting the guard or which may carry magnetic elements to magnetically engage the sides of the skate-runner. In one embodiment, the bottom and sidewalls carry a U-shaped spring member embedded therein to effect the required biasing action for mounting the guard; in another embodiment the sidewalls incorporate magnetic elements for mounting the guard; and in a further embodiment the guard is a resilient slit tubular element which may be bowed upwardly a slight amount to cause the sidewalls of the guard to frictionally engage the sides of the runner when the bottom wall is deflected into mating engagement with the edge of the runner.

3,637,232
CART HAVING COLLAPSIBLE LEGS

Elroy E. Bourgraf, Greenfield, and Robert E. Dunn, Bloomingburg, both of Ohio, assignors to Burt Weil, Cincinnati, Ohio

Filed Oct. 2, 1969, Ser. No. 863,270
Int. Cl. B62b 3/02
U.S. Cl. 280—41 7 Claims

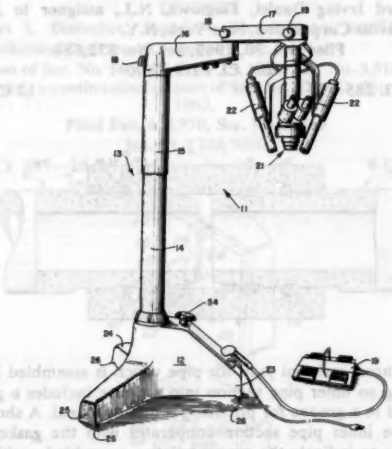


A cart having a frame, auxiliary wheels on the forward end of said frame, four depending legs adapted to swing rearwardly to a collapsed position, releasable means bracing said legs, and an operator for actuating said releasable means, and a safety lock normally maintaining said operator inoperative.

3,637,233
TRANSPORT MECHANISM FOR A SURGICAL MICROSCOPE

Josef K. Hoppl, and Helmut A. Golda, both of Lindenhurst, N.Y., assignors to J. K. Hoppl Corporation, Lindenhurst, N.Y.

Filed Oct. 13, 1969, Ser. No. 865,755
Int. Cl. B62d 21/18
U.S. Cl. 280—43.14 5 Claims

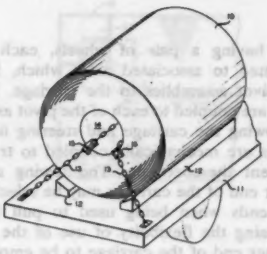


An improved microscope for ophthalmic surgery of the type comprising a base member, an adjustable support member extending upwardly therefrom and means projecting from the support member to suspend the optical components of a microscope and related auxiliary equipment above the operating area. The improvement resides in a novel arrangement of structural elements providing a base member adapted to facilitate movement of the microscope from place to place within the general area of the operating room, which base member is advantageously integrated with other structural components of the microscope.

3,637,234
EDGE PROTECTOR

William E. Thomas, and Gale S. Roush, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Sept. 10, 1969, Ser. No. 856,740
Int. Cl. B60p 7/00
U.S. Cl. 280—179 A 3 Claims

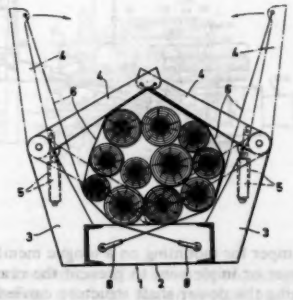


The inner edge of a roll of sheet steel or similar element, which is secured by a tiedown chain, is protected by an edge protector positioned between the element and the chain. The edge protector comprises two plates joined at a right angle and having a contour at the junction conforming to the edge of the element being protected. The plates have ribs to hold the chain on the edge protector.

3,637,235
LOAD CARRIER OF CLAMPING TYPE FOR TREES AND LOGS

Bengt Haldo Karlin, Alfta, and Bengt Lars Larsson, Soderhamn, both of Sweden, assignors to Ostbergs Fabrika AB, Alfta, Sweden

Filed Oct. 13, 1969, Ser. No. 865,718
Int. Cl. B60p 7/00
U.S. Cl. 280—179 A 1 Claim



A clamping load carrier having two arms at respective ends of a supporting beam, said arms being swingable to embrace or relieve a bunch of tree trunks. The improvement consists in that a rope is fixed at the free end of each arm, and in that the supporting beam contains means for pulling the lower extensions of the ropes against the middle portion of the beam to safely clamp the trunks placed on the load carrier when the arms are folded.

3,637,236
COUPLING DEVICE OF TRAILERS

Shusuke Shimoji, 6-4, 5-chome, Mama, Ichikawa, Chiba, and Yasuyuki Takeshita, 22-6 Araki-cho, Shinjuka-ku, Tokyo, both of Japan

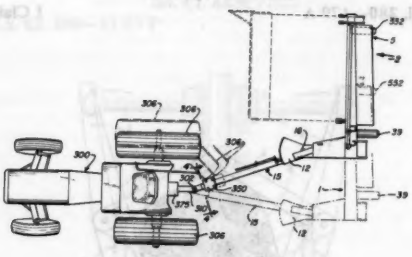
Filed June 3, 1970, Ser. No. 43,148
Claims priority, application Japan, Mar. 9, 1970, 45/19622
Int. Cl. B62d 53/00
U.S. Cl. 280—419 6 Claims

A carriage having a pair of wheels, each pair being rollingly mounted to associated axles which, in turn, are mounted by pivot assemblies to the carriage. Towing and steering levers are coupled to each of the pivot assemblies for respectively towing the carriage and steering its associated axle. The axles are mechanically coupled to transmit rotational movement therebetween. The towing and steering levers of either end of the carriage may be selectively joined at their free ends when being used to pull the carriage thereby increasing the flexibility of use of the carriage by permitting either end of the carriage to be employed as the end to be pulled. Connection between levers of a carriage and trailer or a carriage and another trailer is provided for by a suitable coupling assembly. The towing levers may be adjusted to appropriate lengths to suit particular needs.

3,637,237
TIRE BUMPER FOR TRAILER TONGUE

Thomas J. Scarnato, Barrington; James R. Adams, Downers Grove; Arthur H. Keller, Western Springs, and Peter J. Peacock, Western Springs, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 5, 1970, Ser. No. 9,024
Int. Cl. B60d 1/00
U.S. Cl. 280—462 8 Claims

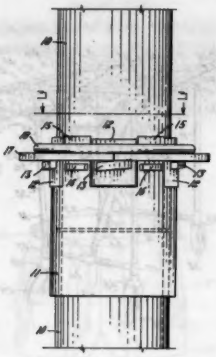


A tire bumper for mounting on a tongue member of a pull-type harvester or implement to prevent the rear wheel tires from engaging the power shaft structure carried on the tongue. The bumper is one piece in one embodiment with a rectangular center section fitting on a complemental tongue and removably clamped thereto for longitudinal adjustment thereon in alignment with the arc of travel of the wheel. In another embodiment reversely arranged identical pieces are bolted about the tongue. Each piece or end of the one piece construction is of apical form to provide diagonal surface areas to the tire so that it will slide against the bumper without tearing up the parts.

3,637,238
DRILL PIPE COUPLINGS

Gottlieb W. Grosch, Silver Creek, Nebr.

Filed Jan. 15, 1970, Ser. No. 3,056
Int. Cl. F16l 21/00
U.S. Cl. 285—39 6 Claims

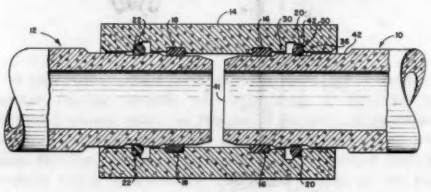


A coupling for safely and detachably connecting lengths of drill pipe into a rotary well drilling string including a cylindrical sleeve mounted on and surrounding the upper extremity of each length to telescopically receive the lower extremity of the next above length. Diametrically spaced pads externally mounted on and adjacent the lower extremity of each length and spaced-apart tenons formed on each sleeve so as to pass between the pads of the next above length to prevent relative rotation between the lengths. A rotatable clamping ring surrounding said tenons and provided with internal segments adapted to be brought into engagement with inclined cam bosses on said tenons to lock the latter in place between said pads.

3,637,239
THRUST-RESISTANT PIPE JOINT

Leonard Irving Daniel, Flagtown, N.J., assignor to Johns Manville Corporation, New York, N.Y.

Filed Oct. 30, 1969, Ser. No. 872,581
Int. Cl. F16l 35/00
U.S. Cl. 285—93 12 Claims



A thrust-resistant joint for pipe which is assembled by inserting an inner pipe section into a sleeve includes a gasket seated in a groove for providing a fluidtight seal. A shoulder on the inner pipe section cooperates with the gasket and groove to indicate the proper relative assembled position of the pipe section and the sleeve. Thrust loads across the pipe joint are transferred between the pipe section and the sleeve by a split locking ring located within a dual diameter annular channel in the sleeve. Assembly of the joint can be accomplished without resorting to a wedging action to seat the locking ring, because the split locking ring can be positioned in a large diameter portion of the annular channel during the

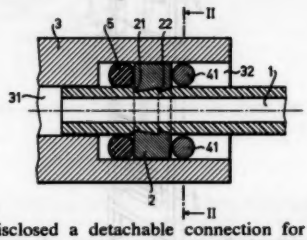
assembly procedure and in a smaller diameter portion of the channel that is at least equal in size to the effective diameter of the locking ring after the pipe joint is assembled.

3,637,240

DETACHABLE CONNECTION FOR A FLUID MEDIUM-PRESSURE HOSE WITH A CONNECTING FITTING

Erwin Meier, Zug, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Mar. 3, 1970, Ser. No. 16,132
Int. Cl. F16l *33/00*
U.S. Cl. 285—238 **5 Claims**



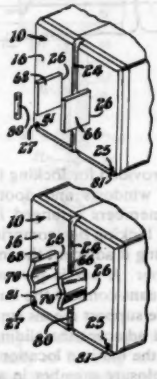
There is disclosed a detachable connection for a fluid medium-pressure hose formed of thermoplastic material with a connecting fitting, wherein a metallic ring member is anchored at a predetermined distance from the end of the pressure hose in the wall thereof, and a sealing O-ring formed of elastomeric material is inserted in a bore of the connecting fitting. The connecting fitting is provided additionally with a pair of tangentially extending substantially parallel bores at the wall means thereof, and a retaining clamp means having leg portions passing through said parallel tangentially extending bores of the connecting fitting serves to hold the metallic ring member in place through the action of the leg portions and engages behind this metallic ring member. The invention is also concerned with an improved method for the fabrication of the detachable connection discussed above.

3,637,241

FABRICATION TECHNIQUE FOR ELECTRICAL DEVICES

Robert I. Dinlocker, Lansdale, Pa., assignor to Electro-Mechanical Instrument Company, Inc.

Division of Ser. No. 563,001, June 15, 1966, Pat. No. 3,510,773, which is a continuation-in-part of Ser. No. 322,476, Nov. 8, 1963.
Filed Feb. 6, 1970, Ser. No. 9,215
Int. Cl. F16b *9/00*
U.S. Cl. 287—20.3 **6 Claims**



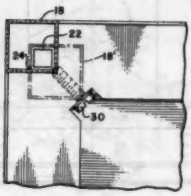
In the fabrication of sheet metal devices, particularly electrical components, a bracket has a main body portion from which a pair of legs extend. The pair of legs extend through slots in a housing and are deformed to rigidly secure the bracket to the housing. Notches in opposite sides of each leg limit the deformation so the deformation does not extend to the body portion.

3,637,242

TABLE LEG ASSEMBLY

Rafael D. Salazar, 3113 75th Ave., Landover, Md.

Filed June 30, 1970, Ser. No. 51,296
Int. Cl. F16b *12/50*
U.S. Cl. 287—23 **4 Claims**



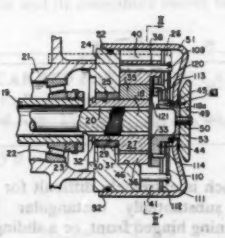
A table leg assembly for tubular legs in which a dowel member of noncircular cross section is secured against the inside wall surfaces of the leg and projects from the end of the leg to be received in a complementary aperture or recess formed in the undersurface of a tabletop, for example. The dowel member is smaller in cross-sectional dimension than the inside of the tubular leg so that when so secured, it is eccentric to the axis of the leg, thereby enabling variation in leg position relative to the top.

3,637,243

FREEWHEEL LOCK MECHANISM

Shin Kitano, and Yutaka Momose, both of Kariya, Japan, assignors to Aisin Seiki Company Limited, Kariya-shi, Aichi-ken, Japan

Filed Apr. 20, 1970, Ser. No. 29,971
Claims priority, application Japan, Apr. 19, 1969, 44/30560
Int. Cl. F16d *1/06*
U.S. Cl. 287—53 **3 Claims**



In the freewheel lock mechanism a split locking ring is provided intermediate a hub on the drive shaft and a flange on the wheel hub. A pawl is slidably mounted in a radial direction in a slot in the flange and is arranged to be moved into a first position intermediate the ends of the split locking ring to couple the locking ring to the flange and a second position wherein the pawl is completely withdrawn from the locking ring to thereby disconnect the drive between the locking ring and the flange. A spring member is connected to the pawl and a manually operated handle is provided for controlling the spring member which in turn will control the position of the pawl relative to the locking ring.

3,637,244

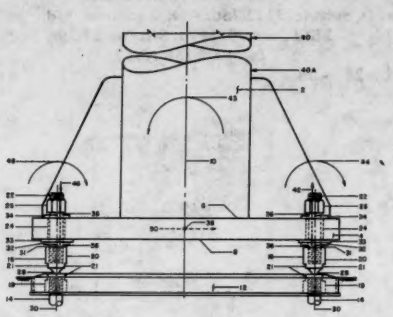
LOAD CONCENTRATED BREAKAWAY COUPLING

Richard A. Strizki, R.D. #1, Ringoes, N.J.

Continuation-in-part of application Ser. No. 799,626, Feb. 17, 1969, now abandoned. This application Mar. 27, 1970, Ser. No. 23,207

Int. Cl. F16d 9/00

U.S. Cl. 287—129 11 Claims



Damage to vehicles and posts in traffic accidents is reduced by providing the posts with circumferentially spaced breakaway couplings spaced radially from the axis of the post and located between the base of the post and a stationary support. Fastening means connected to the couplings secure the base of the post to the support and in preferred embodiments of the invention load concentrating elements eccentric to the axis of the fastening means oppose bending of the couplings under normal loads while presenting little or no resistance to bending of the coupling under impact or other forces applied near the base of the post. The couplings have high tensile strength but relatively little resistance to bending and therefore break readily upon impact of a vehicle with the post.

3,637,245

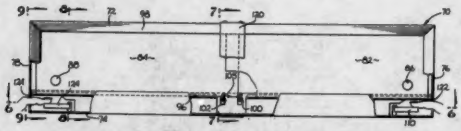
SAFETY MEDICINE CABINET

Walter R. Levack, 7900 Chase Ave., Los Angeles, Calif.

Filed Feb. 4, 1970, Ser. No. 8,490

Int. Cl. E05c 3/28, 7/00, 9/10

U.S. Cl. 292—45 8 Claims



A cabinet which is extremely difficult for a child to open comprising a substantially rectangular box having a downwardly opening hinged front, or a sliding door front, the longest dimension of said box being substantially transverse and designed to be greater than the normal arm length of a five year old child, the front being latched in place by first and second gravity latches, the first latch being moved to the nonlatching position through the use of a first pivotal bar with operation of the first pivotal bar being through an opening in the left side of the cabinet, the second latch being moved to the nonlatching position through the use of a second pivotal bar being with operation of the second pivotal bar being through an opening in the right side of the cabinet, each of the first and second latches being interiorly spaced from their respective sides a distance to prevent actuation by a child, both the first and second latches must be in the nonlatched position to permit opening of the cabinet.

3,637,246

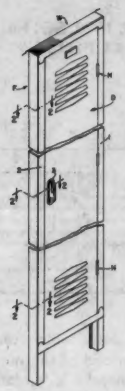
LATCHING MECHANISM

Earl P. Leiter, Youngstown, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Apr. 8, 1970, Ser. No. 26,699

Int. Cl. E05c 19/06

U.S. Cl. 292—87 12 Claims



A locker latching assembly includes a rigid frame hook having a catch member mounted upon one component of an enclosure and cooperating with a latch element having a resilient finger mounted upon another component of the enclosure. Integral means are provided on the latch element to permit ready attachment thereof to a lock bar without the use of separate fastening elements.

3,637,247

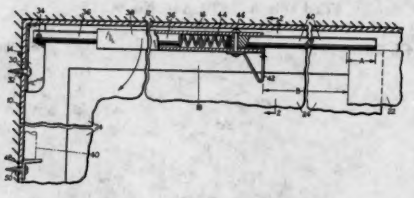
LOCKING BAR FOR HORIZONTALLY SLIDING BUILDING CLOSURE ASSEMBLIES

Peter M. Manion, 5130 N.E. Ainsworth Court, Portland, Oreg.

Filed July 10, 1970, Ser. No. 53,831

Int. Cl. E05c 17/04, 19/16

U.S. Cl. 292—262 3 Claims



A locking bar is provided for locking the sliding member of horizontally sliding windows and doors comprising sliding and fixed closure members arranged in lapped relation in parallel planes. The locking bar comprises a base and securing means for securing it adjacent the inner, upper end of the fixed closure member. A bar is pivotally connected to the base. Connecting means connect the inner end of the locking bar to the base while support means support the outer end of the bar parallel and adjacent the sliding closure member. A stop is mounted on the bar in a location predetermined to intercept the sliding closure member in a predetermined location, thereby determining the extent of opening of the sliding closure member.

3,637,248

HOLDER FOR CHOPSTICKS

Miyoichi Arita, 1427 Dillingham Blvd., Honolulu, Hawaii

Filed Dec. 9, 1969, Ser. No. 883,504
Int. Cl. A47g 21/00
U.S. Cl. 294—16 1 Claim

A pair of spaced upstanding downwardly tapering sleeve portions interconnected by an integral inverted U-shaped bow spring portion including a pair of depending legs whose lower ends are joined to adjacent side portions of the upper ends of the sleeve portions. The sleeve portions are adapted to have all but the upper end portions of a pair of chopsticks downwardly inserted therethrough with the upper end portions of the chopsticks wedgingly received in the sleeve portions. Further, the bow spring serves to yieldingly bias the lower ends of the sleeve portions upwardly and away from each other, whereby the chopsticks supported from the holder may be readily supported by inexperienced persons merely by finger contact with the remote surfaces of the chopsticks below their points of support from the tapered sleeve portions of the holder.

3,637,249

AUTOMATIC LOADER HEADS

Henry Y. Kuhl, and Paul R. Kuhl, both of P.O. Box 26, Flemington, N.J.

Filed June 29, 1970, Ser. No. 50,639
Int. Cl. B66c 1/02
U.S. Cl. 294—64 5 Claims

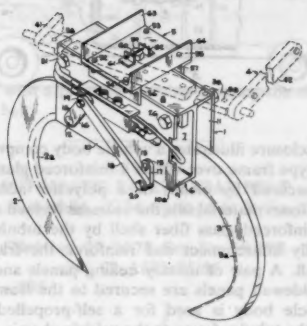
A vacuum egg-lifting device is provided with a vacuum head carrying a plurality of holding members within which tubular stems are slidably movable within predetermined limits against the action of a spring while being accurately guided by the holding members. The stems have flexible egg-engaging cups at the lower ends thereof to which a vacuum and air pressure may be applied from the vacuum head for lifting and discharging eggs from the device.

3,637,250

GRAPPLE

Joseph E. Blonsky, Atlanta, Ga., assignor to American Pulpwood Association, New York, N.Y.

Filed Dec. 7, 1970, Ser. No. 95,514
Int. Cl. B66c 3/16
U.S. Cl. 294—88 9 Claims



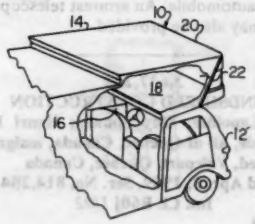
A grapple adapted for mounting on vehicles such as farm tractors includes an open-ended housing structure having top, bottom and spaced sidewalls together with a main medial supporting plate interconnected integrally with the top and bottom walls. The web plate and the top and bottom walls are formed of a section of a conventional I-beam. A pair of tines are pivotally mounted one on each side of the web plate on stub shafts near the open ends of the housing structure and motive means within the housing imparts operating movement to the tines. The tines are interconnected with each other by means of a system of coupling cranks affixed to the stub shafts and an interconnecting coupling link and the entire structure is supported by the vehicle on a transverse swivel bar supported by the tractor which is received within a swivel cavity formed atop the housing structure and rigidly secured thereto. The swivel cavity is arranged so as to accommodate angular movement or yaw of the grapple relative to the vehicle and its associated swivel bar.

3,637,251

OVERCAB BED FOR MOBILE CAMPERS

John D. Plant, Jr., Branford, Conn.

Filed Aug. 17, 1970, Ser. No. 64,489
Int. Cl. B60p 3/34
U.S. Cl. 296—23 R 4 Claims



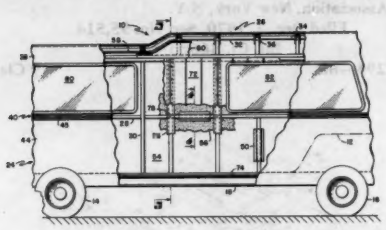
An overcab bed in a camper vehicle of the type comprising a camper body combined with a panel truck, wherein the bed includes a platform having a slidable portion to provide access to the cab portion during nonsleeping hours.

3,637,252

VEHICLE BODY CONSTRUCTION

William E. Metsker, Tulsa, Okla., assignor to Avco Corporation, Tulsa, Okla.

Filed Mar. 27, 1970, Ser. No. 23,369
Int. Cl. B62d 29/04
U.S. Cl. 296—31 P 9 Claims



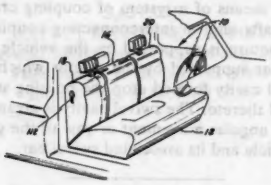
The disclosure illustrates a vehicle body comprising a tubular cage-type frame over which a reinforced glass fiber outer shell is secured by means of a polyester adhesive. Rigid urethane foam material fills the recesses formed on the inside of the reinforced glass fiber shell by the tubular frames to structurally interconnect and reinforce the frame and the outer shell. A pair of unitary ceiling panels and a series of vertical sidewall panels are secured to the frame members. The vehicle body is used for a self-propelled vehicle by securing the tubular frame to the vehicle chassis.

3,637,253

LATERALLY SLIDABLE SEAT

Warren E. Maule, 345 Ford Ave., Highland Park, Mich., and Charles S. Seidel, Royal Oak, Mich., assignors to said Maule, by said Seidel

Filed Oct. 3, 1969, Ser. No. 863,512
Int. Cl. B60n 1/04
U.S. Cl. 296—65 R 18 Claims



A passenger seat having a fixed bottom section and a fixed central backrest section with telescoping end sections. Each of the two ends of the back section are slidably mounted on a pair of rails that are secured to the central back section for lateral motion into an opening formed on the end of the central backrest section, allowing a passenger entrance into the back seat of the automobile. An armrest telescoping from the bottom section may also be provided.

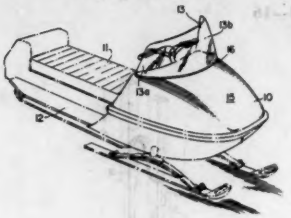
3,637,254

WINDSHIELD CONSTRUCTION

Yves Anselme Lapointe; Guy Simard; Henri Emond, and Pierre A. Delisle, all of Quebec, Canada, assignors to Bombardier, Limited, Valcourt, Quebec, Canada

Filed Apr. 8, 1969, Ser. No. 814,284
Int. Cl. B60j 1/02
U.S. Cl. 296—84 15 Claims

A windshield made of a screen member normally of plastic material, mounting means formed of a rubber moulding strip disposed between the lower edge of the screen member and the body of the vehicle, and a series of fasteners mechanically interconnecting the screen member to the receiving surface of the body at spaced-apart locations along the lower edge of the screen member.

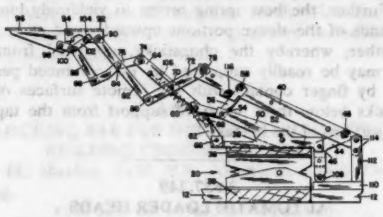


3,637,255

MECHANISM FOR ROCKER/RECLINING CHAIR AND FOR RECLINING CHAIR

Frank M. Re, Holyoke, Mass., assignor to Dual Manufacturing and Engineering, Incorporated, Holyoke, Mass.

Filed Jan. 2, 1968, Ser. No. 694,985
Int. Cl. A47c 3/03
U.S. Cl. 297—85 4 Claims



A multipurpose rocker recliner including a base and a chassis and a rocker-spring mechanism and a body-supporting unit and hardware means incorporating first stop means for restraining the body-supporting unit against rocking in positions between intermediate reclined and fully reclined positions and second stop means for restraining the body-supporting unit against tipping in the fully reclined position and third stop means for maintaining the foot stool in retracted position when in the fully upright position and for precluding assumption of a reclined position of the body-supporting unit without a concomitant projection of the foot stool into extended position.

3,637,256

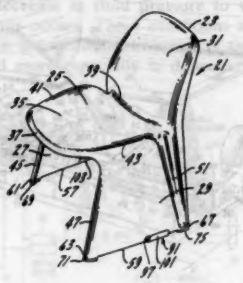
CHAIR CONSTRUCTION

M. Fillmore Harty, Bloomfield Hills, Mich., assignor to The Shaw-Walker Company, Muskegon, Mich.

Filed June 16, 1969, Ser. No. 833,471
Int. Cl. A47c 15/00, 3/04
U.S. Cl. 297—248 10 Claims

A molded one-piece chair having a back, a seat and sides with the back extending upwardly and rearwardly from the seat and the sides depending from the back and the seat and being inclined outwardly from the seat. An outwardly and rearwardly extending concave convolution is formed in each side of the chair for strength and to assist in stacking one

chair on top of another. A trough is located between the seat and the back of the chair and blends into the convolutions



for strengthening the chair. Connecting means are provided for joining similar chairs side by side in a row.

3,637,257

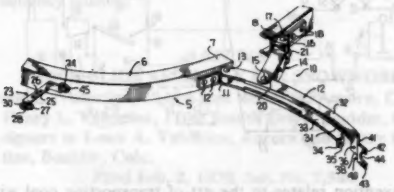
LOCKING BAND ASSEMBLY

Charles A. Uncapher, Worth, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 22, 1970, Ser. No. 39,768

Int. Cl. B65d *45/34*

U.S. Cl. 292—256.69 **4 Claims**



This disclosure relates to a locking band assembly for securing covers on drums and other similar applications. Such a locking band assembly includes a handle which, together with a link, functions as a lever to draw end portions of the locking band together. After the handle is in the band tightening position thereof, it is latched in place. This disclosure particularly relates to the provision of an extension on the handle engageable with a lock member of the latch mechanism to hold the handle in place during the actuation of the latch mechanism.

3,637,258

SAFETY BELTS INCORPORATED IN A VEHICLE'S SEAT

Patrice Marie Bayon, Le Prieure, Avrille, (Maine-et-Loire), France

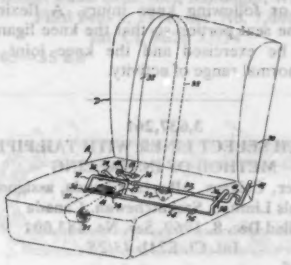
Filed Sept. 26, 1969, Ser. No. 861,335

Claims priority, application France, Sept. 27, 1968, 167944

Int. Cl. B60r *21/10*; **A47d** *15/00*

U.S. Cl. 297—389 **8 Claims**

The belt consists of a strap on which one end passes round the back, the between said back and the seat, to be wound round the drum of an automatic winder mounted at one end of a shaft whose other end comprises a locking device



cooperating with a pivoting member forming the third fixing point of the belt.

3,637,259

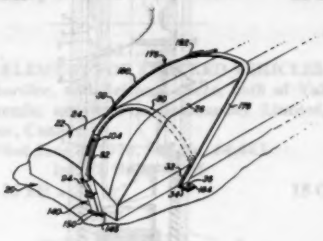
AUTOMATIC SAFETY SEAT BELT

Barbara G. Rothschild, 2134 Springdale Drive, Columbus, Ga.

Filed July 29, 1970, Ser. No. 59,298

Int. Cl. A62b *35/60*

U.S. Cl. 297—385 **16 Claims**



An automatic safety seat belt for use in a vehicle and including an arcuate tubular body support member which is biased to an operative position obstructing seat occupancy and thus necessitating its use, and a latch assembly which is selectively operated in response to actuation of the vehicle power switch to positively retain the arcuate support member in such operative position about the body of a vehicle passenger.

3,637,260

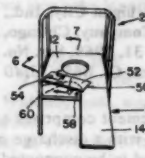
INTEGRAL SEAT AND LEG SUPPORT

Leigh E. Eisenhauer, 3 Warren Road, Van Wert, Ohio

Continuation-in-part of application Ser. No. 776,917, Nov. 19, 1968. This application Aug. 10, 1970, Ser. No. 62,337

Int. Cl. A47c *1/037, 4/52*

U.S. Cl. 297—433 **4 Claims**



A combination seat and leg support which is preferably in the form of an elongated substantially flat board having a seat portion and a leg supporting portion extending outward

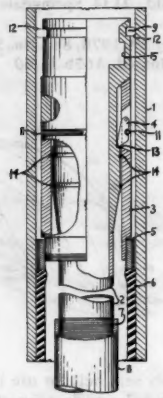
from one side of the front edge of the seat portion to support one leg of a person sitting on the seat portion without interfering with the person's other leg. The combination seat and leg support may for example be used by a person having an injured knee or following knee injury. A flexing bar is mounted on the seat portion so that the knee ligaments and muscles may be exercised and the knee joint gradually returned to a normal range of activity.

3,637,261

TOP LATCH SELECT LINER WITH TAILPIPE AND METHOD OF INSTALLING

Selby W. Porter, Calgary, Alberta, Canada, assignor to Kalium Chemicals Limited, Saskatchewan, Canada

Filed Dec. 8, 1969, Ser. No. 883,001
Int. Cl. E21b *43/28*
U.S. Cl. 299—5 **3 Claims**



A top latch select liner is shown which provides for the attachment at the top of a select liner of large pipe assemblies for use in solution mining operations. A method of lowering tailpipes of heavy construction safely into a solution mining cavity is also shown which involves the use of casing fluid and hydraulic pressures so that the pipes can be lowered on wire lines.

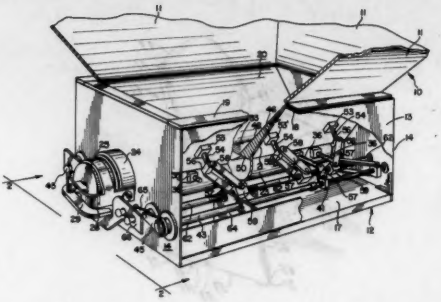
3,637,262

PNEUMATIC DISCHARGE ARRANGEMENT

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Transport Leasing Company, Chicago, Ill.

Filed Dec. 31, 1969, Ser. No. 889,497
Int. Cl. B65g *53/40*
U.S. Cl. 302—52 **17 Claims**

A discharge arrangement comprises a hopper having sloping sidewalls provided with a discharge opening communicating with a tube adapted to be connected to a pneumatic conveying system. The discharge opening is provided with a valve member which cooperates with a movable valve element to regulate the discharge of material. The valve is movable horizontally and includes opposed cutting edges which cooperate with the valve element in cutting through the material during closing of the valve. The valve element is movable upwardly free of the valve so that all the edges of



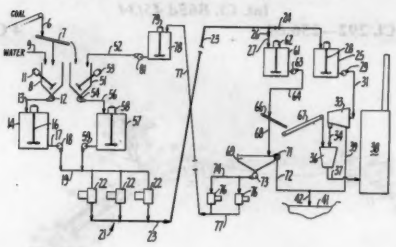
the valve and valve element are free and clear and can be cleaned during a cleanout operation.

3,637,263

TRANSPORTATION OF COAL BY PIPELINE

Edward J. Wasp, San Rafael, Calif., assignor to Bechtel International Corporation

Filed Mar. 3, 1970, Ser. No. 16,160
Int. Cl. B65g *53/04*
U.S. Cl. 302—66 **4 Claims**



This invention relates to the art of transporting coal with water through pipelines. More particularly, it relates to a method of preparing at one point an aqueous slurry made up of a mixture of particulate coal and an inorganic finely divided water insoluble solid carrier having a specific gravity of at least 1.6. The slurry is then pumped through a pipeline to a location many miles away where, after being separated from the carrier, the coal is utilized and the coal-free carrier is returned to the point of beginning. By using a material heavier than coal, the settling rate of the coarse coal can be reduced nearly to zero while maintaining turbulent flow conditions.

3,637,264

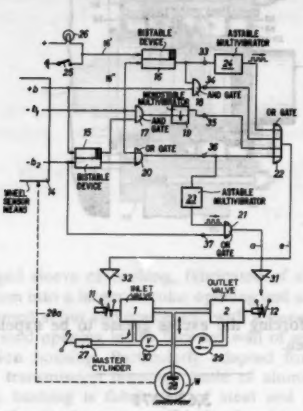
ANTILOCKING CONTROL FOR PRESSURE ACTUATED BRAKES

Heinz Leiber, Leimen, and Anton Rodi, Karlsruhe, both of Germany, assignors to Teldix G.m.b.H., Heidelberg-Wieblingen, Germany

Filed Mar. 18, 1970, Ser. No. 20,511
Claims priority, application Germany, Mar. 22, 1969, P 19 14 765.0
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 BE **14 Claims**

The pressure of the brake-actuating fluid in an antilocking brake control system is varied by pulsing the control valve or

valves for durations which are varied to be greater or lesser than the period of that limiting frequency above which the brake system can not respond. In the former case, a rapid increase in fluid pressure or a rapid decrease in fluid pressure occurs, whereas in the latter case, a less rapid average or net increase or decrease in fluid pressure to which the brake system responds occurs. These conditions are controlled in dependence on the rotational behavior of the vehicles wheel or wheels and more especially in dependence on predeter-



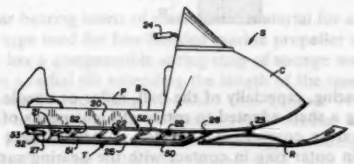
mined changes in angular velocity of the wheel. Moreover, either variation in pulse duration at fixed frequency or variation in frequency at fixed pulse duration may be effected during high-frequency pulsing so as further to alter the net increase or decrease in fluid pressure. This further alteration is effected as a function of time from the beginning of the high-frequency pulsing.

3,637,265

TRACK SLIDE ASSEMBLY FOR SNOWMOBILES

Louis A. Valentine, 11444 East 4th Way, Aurora, Colo., and Henry L. Valentine, 1100 Toedtli Drive, Boulder, Colo., assignors to Louis A. Valentine, Aurora and Henry L. Valentine, Boulder, Colo.

Filed Feb. 2, 1970, Ser. No. 7,540
Int. Cl. B62m *27/02*
U.S. Cl. 305—24 **11 Claims**



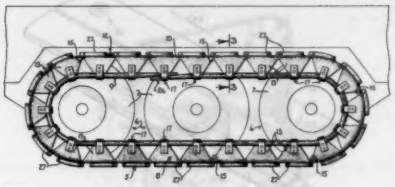
A track slide suspension for a snowmobile mounted between the forward drive wheels and the rearward idler wheels of the snowmobile drive track. This suspension includes longitudinally extended frame bars separated by transverse pivot bars. The frame bars are secured to any selected type of snowmobile by a proper arrangement of lugs fitted to mounting points on the snowmobile. The slide suspension includes forward and rearward pairs of skids carried on biased rocker arms so each pair of skids being independent of the other, will yield as the snowmobile travels over a rough snow surface.

3,637,266

ENDLESS TREAD FOR OFF-HIGHWAY VEHICLES, HAVING NONRIGID ELEMENTS

Curtis T. Busse, Busse Bros. Inc., Randolph, Wis.

Filed Feb. 2, 1970, Ser. No. 7,646
Int. Cl. B62d *55/24*
U.S. Cl. 305—35 EB **7 Claims**



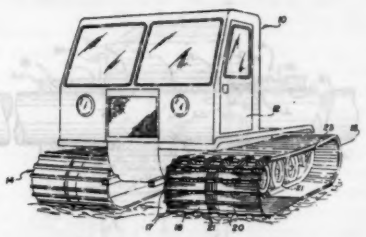
A band of supple material—the endless tread proper—is looped around a set of wheels. A looped tensioning cord overlies each face of the wheels, and supple connectors extend from each edge of the band to its adjacent tensioning cord, connectors being anchored to each cord at spaced intervals along it. Elasticity of the cord accommodates changes in anchorage spacing in different parts of the orbit. The cords tension the connectors inwardly of the band loop, over the wheel faces, to keep the tread on the wheels.

3,637,267

CLEAT ELEMENT FOR TRACKED VEHICLES

Jacques Bombardier, and Rejean Leclerc, both of Valcourt, Quebec, Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada

Filed June 8, 1970, Ser. No. 44,443
Int. Cl. B62d *55/26*
U.S. Cl. 305—35 EB **15 Claims**



A cleat element for fixing to the outer surface of an endless flexible track, and particularly to that type of track found on snow-compacting vehicles, is provided having a triangular shape and constructed of an angle iron filled with rubber contained within its sidewalls. An an antiskidding device, the vehicle is provided with a plurality of rubber pads integrally mounted on the rubber face and disposed at spaced- apart locations along the length of the surface.

3,637,268

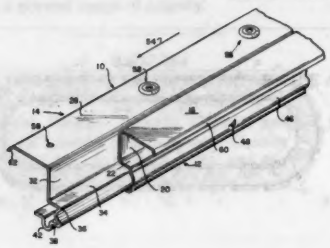
TABLE SLIDE

Thomas G. Walter, Wabash, Ind., assignor to B. Walter & Company, Wabash, Ind.

Filed May 8, 1970, Ser. No. 35,749
Int. Cl. F16c *21/00, 29/00*
U.S. Cl. 308—3.6 **5 Claims**

A table slide comprising first and second extensibly related slide members, each of which is formed from sheet stock to provide longitudinally extending web sections and/or web portions which slidably contact similar web sections and/or

web portions of the other member. The first member serves as an outer member and is provided with an outwardly extending channel section, the lower horizontally extending leg of which is provided with a longitudinally extending trough



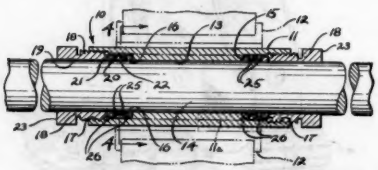
intermediate its lateral edges. The second member is provided with a portion which conformingly fits into the said channel section, including a longitudinally extending ridge portion which conformingly slidably engages the trough.

3,637,269

JOURNAL SLEEVE FOR RELATIVE ROTATION IN A BEARING

Burrell J. Lantry, Cuyahoga Falls, Ohio, assignor to Lucian Q. Moffitt, Inc., Akron, Ohio

Filed Nov. 26, 1969, Ser. No. 880,089
Int. Cl. F16c *33/78*
U.S. Cl. 308—237 A 9 Claims



Journal sleeve for a shaft, as for relative rotation of the shaft with the sleeve thereon, within a shaft bearing. Sleeve has annular chambers containing elastic rings, and means for axially compressing the rings, to expand the same radially into tight locking engagement between the shaft and opposing wall portions of the sleeve.

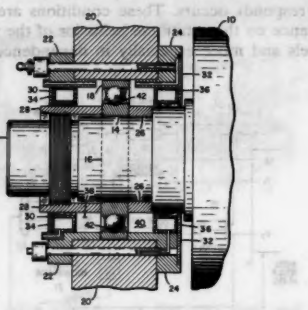
3,637,270

BEARING GREASING SYSTEM

Wesley R. Johnson, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,723
Int. Cl. F16c *33/66*
U.S. Cl. 308—187 4 Claims

A method of regreasing bearings on a high-speed rotating magnetic memory drum is disclosed The method includes the use of two inflatable, rubber inner tube rings on both sides of the bearing that is to be greased. With the drum stopped, grease is forced between the two low-pressure inflated rings; one ring is then high-pressure inflated forcing the grease through the bearing into the low-pressure inflated ring side of the bearing; the low-pressure inflated ring is then high-pressure inflated forcing the excess grease to be expelled from the bearing area.

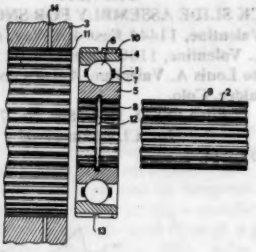


3,637,271

BEARING INTENDED TO SUPPORT A SHAFT CAPABLE OF ROTATING AT HIGH SPEEDS

Gaston Bayard, 6, Place Wilson, Toulouse (Haute Garonne), France

Filed Apr. 21, 1970, Ser. No. 30,371
Claims priority, application France, May 30, 1969, 6917772
Int. Cl. F16c *1/24*
U.S. Cl. 308—187 3 Claims



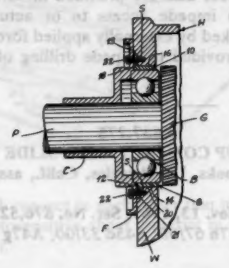
A bearing, especially of the ball, roller or needle type, for carrying a shaft adapted to rotate at high speeds of rotation, said bearing comprising an inner ring in contact with the shaft, an outer ring in contact with the bearing surface of a supporting member and at least one row of balls, rollers, needles or the like imprisoned in a cage, the bore of said inner ring and the diameter of said shaft being dimensioned in such manner as to maintain between said elements a radial clearance at least equal to the distance between the axis of inertia of the assembly of rotating parts and the geometric axis of said inner ring, while the diameter of said outer ring and the bore of the bearing surface of the supporting member are so dimensioned as to maintain between said elements a small radial clearance of the order of a few microns. The facing surfaces of the inner ring and the shaft and the outer ring and the bore of the supporting member are rendered fast for rotation with each other and the radial clearances may be filled with fluid under pressure.

3,637,272

BUSHING INSERT FOR ANTIFRICTION BEARING ASSEMBLIES

Michael G. Christiansen, 2524 Telegraph Road, St. Louis, Mo.

Filed Apr. 9, 1970, Ser. No. 26,983
Int. Cl. F16c *33/08*
U.S. Cl. 308—189 1 Claim



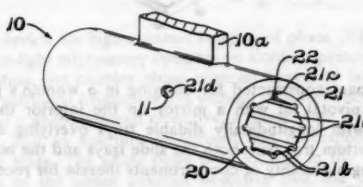
A flanged sleeve or bushing, fabricated of steel, adapted for insertion into a larger circular opening and a countersunk recess formed about and concentric with a somewhat smaller but deformed opening in the forward wall of an automotive transmission housing. Particularly adapted for use in the repair of transmission housings made of aluminum or cast iron. The bushing is fabricated of steel and designed for mounting therein the same antifriction bearing assembly that had been originally mounted in said smaller opening prior to its deformation.

3,637,273

ELASTOMERIC BEARING

Roy L. Orndorff, Jr., Kent, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,780
Int. Cl. F16c *33/20, 43/00*
U.S. Cl. 308—238 10 Claims



A tubular bearing insert of elastomeric material for a bearing of the type used for free-flooded marine propeller shafts. The insert has a compressible spring strip of sponge material disposed in a radial slit extending the length of the insert for circumferentially expanding the insert into contact with the bore of the bearing housing. A portion of the tubular wall of the insert is radially deformable with a lug extending outwardly therefrom for releasable engagement with a corresponding recess provided in the bore of the bearing housing in which the insert is to be assembled.

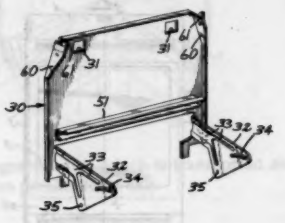
3,637,274

ADAPTER ASSEMBLY FOR TOWEL CABINETS

Malcolm O. Manuel, Stanton, Minn., assignor to Universal Dispensers, Ltd., Minneapolis, Minn.

Filed Mar. 6, 1970, Ser. No. 17,262
Int. Cl. B65h *19/00*
U.S. Cl. 312—38 5 Claims

A universal adapter plate having openings therein for engaging mounting brackets on the rear wall of a towel dispenser cabinet and projections designed to engage a variety of standard towel metering and rewinding mechanisms, a cradle pivotally affixed to the adapter plate for receiving therein a roll of clean towels and a plurality of cooperating ridgelike projections at the back of the cradle



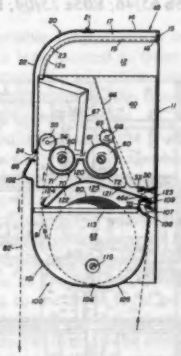
and the front of the adapter plate positioned to form a tortuous towel rewind path to produce a desired amount of tension on the towel and to smooth out wrinkles and creases so that it will rewind properly after use.

3,637,275

TOWEL DISPENSER WITH COVERED CLEAN TOWEL RECEPTACLE

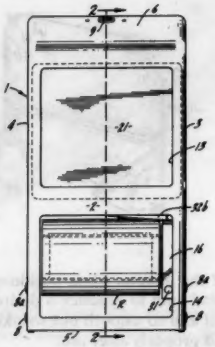
Erwin B. Bahnsen, Oakbrook, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah

Filed Jan. 15, 1970, Ser. No. 8,125
Int. Cl. B65h *19/00*
U.S. Cl. 312—38 9 Claims



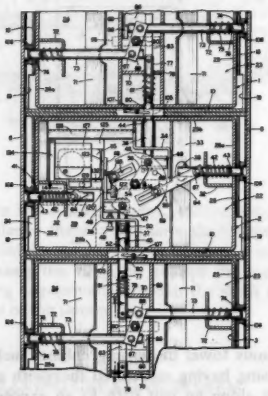
A continuous towel dispensing cabinet includes an open-bottom housing having associated therewith a loop of towel that extends along an exit path to an exposed position accessible to a user and thence along a return path into the housing, an open-top clean towel receptacle mounted in the bottom of the housing for pivotal movement between dispensing and loading positions, dispensing apparatus and soiled towel takeup means mounted in the housing overlying the receptacle for respectively feeding clean towel to the exit path and retracting soiled towel from the return path, and a cover hingedly mounted on the rear wall of the receptacle for pivotal movement between a closed configuration substantially closing the open top of the receptacle and an open configuration to facilitate loading the receptacle.

3,637,276
DISPENSER
Edward L. Bump, Oak Park, Ill., assignor to Vaughan Mfg. Co., Chicago, Ill.
Filed June 15, 1970, Ser. No. 46,307
Int. Cl. B65h *19/00*
U.S. Cl. 312—39 **15 Claims**



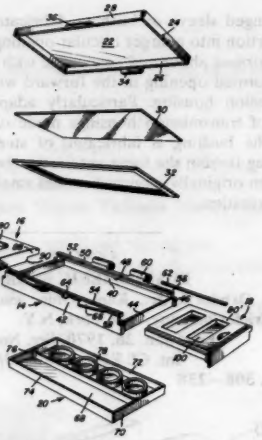
A dispenser for rolls of paper having a door covering one roll and a control arm responsive to depletion of the paper on another roll to release said door for movement into a position exposing said one roll.

3,637,277
ENTRY RESISTANT SECURITY FILE CONSTRUCTION
Newton J. Krug, Cincinnati; Richard B. McClain, Massillon, and James D. Shoop, Canton, all of Ohio, assignors to Diebold, Incorporated, Canton, Ohio
Filed Jan. 12, 1970, Ser. No. 2,240
Int. Cl. E05b *65/46;* **E05c** *15/04;* **E05b** *15/16*
U.S. Cl. 312—217 **14 Claims**



A security file which has a gang-lock bolt mechanism that extends vertically along and generally centrally of the drawer fronts of a plurality of drawers operated by a handle in a main drawer. The operating handle also operates horizontal bolts in the main drawer. There are mullions between the drawer fronts through which the gang-lock mechanism extends. When actuated to lock the drawers, the gang-lock bolts move a substantially greater distance vertically than the movement of the horizontal bolts in the main drawer. The other drawer heads of the plurality of drawers also have individually actuated horizontal bolts which lock their drawers automatically when the drawers are fully closed. Detents are provided which prevent horizontal bolt locking of any drawer unless such drawer is fully closed. Gang-lock stop devices also are provided which prevent actuation of the gang-lock mechanism unless all drawers are fully closed. Backup pins and relocking devices also are provided in various areas of the mechanism to impede access to or actuation of the mechanism if attacked by externally applied force. Protective devices also are provided to impede drilling of the ends of the lock bolts.

3,637,278
EYE MAKEUP COMPACT WITH SLIDE TRAYS
David S. Easterbrooks, Los Angeles, Calif., assignor to Anc Maria, Inc.
Filed Nov. 13, 1969, Ser. No. 876,529
Int. Cl. A47b *67/00;* **A45d** *33/00;* **A47g** *1/00*
U.S. Cl. 312—227 **5 Claims**



A compact constructed for carrying in a woman's purse having a pivotal lid with a mirror on the interior thereof together with longitudinally slidable trays overlying a stationary bottom tray with both the slide trays and the bottom tray having a plurality of compartments therein for receiving eye makeup.

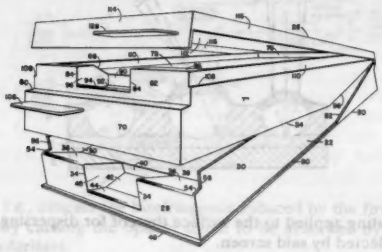
3,637,279
DUAL COMPARTMENT PAPER SAFE
Kenneth G. Brooks, Route 1, Box 379, Vashon, Wash.
Filed Apr. 22, 1970, Ser. No. 30,884
Int. Cl. A47b *88/00*
U.S. Cl. 312—303 **15 Claims**

This invention is directed to a paper safe for use in a darkroom for exposing and developing photographic paper, i.e., a photosensitive sheet material.

This paper safe comprises a first storage compartment, a second storage compartment and a cover. The first and second storage compartments are in a nesting or interlocking relationship with respect to each other so as to minimize the amount of light which can enter into the first storage compartment. The second storage compartment and the cover are in a nesting or interlocking relationship with respect to each other so as to minimize the amount of light which may enter into the second storage compartment.

The first and second storage compartments are so arranged with respect to each other that it is easy to remove the

photosensitive sheet material from the first storage compartment. The second storage compartment and the cover are so



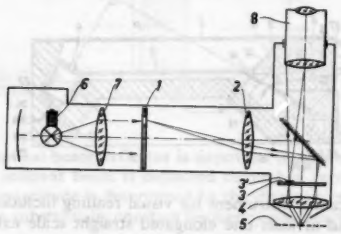
arranged with respect to each other that it is easy to place an exposed photosensitive sheet material in the second storage compartment.

3,637,280

DEVICES FOR HIGH-CONTRAST IMAGING OF PHASE OBJECTS IN INCIDENT-LIGHT MICROSCOPY

Hermann Beyer, and Gunter Schoppe, both of Jena, Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

Filed May 12, 1970, Ser. No. 43,273
Int. Cl. G02b *21/14*
U.S. Cl. 350—13 5 Claims



A device for high-contrast imaging of phase objects in incident-light microscopy operates on Kohler's principle of illumination and enables phase contrast images to be obtained with sufficient brightness and without reflexes. The device includes a phase contrast objective, a phase plate with a phase layer, and an aperture diaphragm that corresponds to the phase plate. The phase plate is so located in the rear focal plane of the phase contrast objective that the diaphragm image produced in the focal plane of the objective after reflection on the specimen surface is covered by the phase layer and that the diaphragm image produced directly by an illumination lens appears in a portion of the objective focal plane which is not covered by the phase layer.

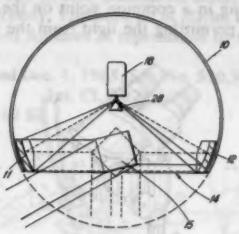
3,637,281

OPTICAL SCANNING EQUIPMENT

Frank Arthur Gull, 28 Oaklands Lane, Smallford, Hertfordshire, England

Filed Mar. 27, 1969, Ser. No. 811,698
Claims priority, application Great Britain, Apr. 1, 1968, 5,299/68
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 8 Claims

Aerial photographic-equipment of the line-scanning type in which two parabolic mirrors lie on either side of a square-section rotor with four mirror faces that reflect the scanning beam on to a ridge mirror above the rotor and by which it is directed to an infrared detector cell. The signal from the IR cell is employed to modulate a light beam at one end of the rotor, which modulated beam is reflected out radially from the rotor optical systems within the rotor so as to traverse re-



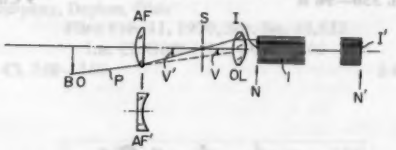
peatedly a photographic film which is transported above the rotor in a direction parallel to its axis.

3,637,282

ELONGATED VARIABLE MAGNIFICATION OPTICAL SYSTEM HAVING SELECTIVELY INTERCHANGEABLE LENSES

Yoshisada Hayamizu; Toshiyuki Mori, and Rikizo Murata, all of Tokyo, Japan, assignors to Olympus Optical Co., Inc., Tokyo, Japan

Continuation-in-part of application Ser. No. 634,931, May 1, 1967, now abandoned. This application Feb. 21, 1970, Ser. No. 4,728
Int. Cl. G02b *5/16, 15/06*
U.S. Cl. 350—39 10 Claims



An elongated variable magnification optical system comprising an objective lens located in front of an image transmitting optical system, the objective lens being adapted to focus the image of an object on the front end surface of the image transmitting optical system, an aperture diaphragm located at a position adjacent to the front focal point of the objective lens, selectively interchangeable lens systems each selectively located in front of the aperture diaphragm thereby permitting the magnification of the entire optical system to be varied by interchanging the interchangeable lens system. A further additional lens system may be located at a position adjacent to the aperture diaphragm in such a manner that the rear principal plane of the further additional lens system is positioned adjacent to the front focal point of the objective lens, thereby permitting the rear focal plane of the combined optical system located in front of the image transmitting optical system to be shifted within an appropriate range without varying the focal length of the combined optical system.

3,637,283

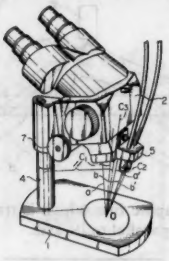
STEREOMICROSCOPE WITH ILLUMINATION BY SPECULARLY REFLECTED LIGHT

Toshio Tasaki, and Keiji Fukao, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 6, 1970, Ser. No. 52,364
Int. Cl. G02b *21/06*
U.S. Cl. 350—91 2 Claims

Illuminating system for a stereoscopic microscope which directs a pair of illuminating light beams toward the viewed object. The angle formed between the beams is equal to the parallax angle formed between the optical axes of the two objective lenses of the microscope while the plane defined by the bisectors of the parallax angle and of the angle between

the illuminating beams is perpendicular to the planes respectively defined by the optical axes of the objective lenses and the illuminating beams, the optical axes and the illuminating beams converging in a common point on the surface of the object, thereby permitting the light from the respective illu-



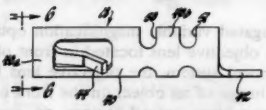
minating beams to be directly reflected by the surface of the object to a respective objective lens so that the object is observed in a bright field of view while the stereoscopic observation of the object is carried out.

3,637,284

MALE CONNECTOR TERMINAL FOR FIBER-OPTIC BUNDLES

Robert G. Plyler, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1969, Ser. No. 886,879
Int. Cl. H01r *15/04*; G02b *5/14*
U.S. Cl. 350—96 B **9 Claims**



In a preferred form, this disclosure relates to an end connector for a fiber-optic bundle and to a fiber-optic assembly for transmitting light from a light source to a location remote from the light source. The fiber-optic assembly comprises a lens, a fiber-optic bundle having a surrounding sheath along its longitudinal extent and an end connector which is crimped onto one end portion of the fiber-optic bundle and connected to the lens. The connector is in the form of an axially slit, substantially cylindrical, metal sleeve having a plurality of circumferentially spaced circumferentially elongated slots and with the sleeve along the periphery of the slots having sharp radially inwardly extending burrs which cut into the surrounding sheath of the fiber-optic bundle when the sleeve is crimped thereon.

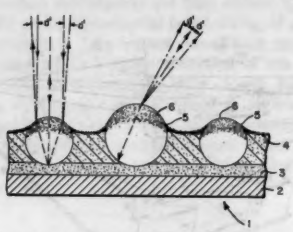
3,637,285

REFLEX LIGHT REFLECTOR

Marshall E. Stewart, Redondo Beach, Calif., assignor to Stewart Filmscreen Corp., Torrance, Calif.

Filed June 23, 1970, Ser. No. 49,029
Int. Cl. G02b *5/12*
U.S. Cl. 350—105 **9 Claims**

A reflex light reflector comprising a reflective screen for reflecting both paraxial and normal rays and having a diffu-



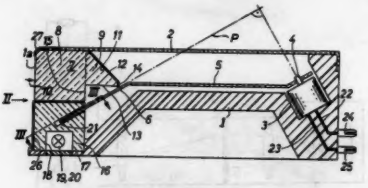
sion coating applied to the surface thereof for dispersing light rays reflected by said screen.

3,637,286

INDICATING INSTRUMENT FOR VISUAL READING

Willy Kisselmann, Grunwald near Munich; Fritz Rumpelein, Munich, and Paul Kopf, Unterhaching near Munich, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 20, 1970, Ser. No. 21,416
Claims priority, application Germany, Mar. 24, 1969, P 19 14 947.4
Int. Cl. G02b *27/02*
U.S. Cl. 350—112 **26 Claims**



An indicating instrument for visual reading includes a flat housing and at least one elongated straight scale extending along a narrow front side of the housing. A moving-coil instrument in the housing has a pointer whose tip is located in a plane making a right angle with the pointer axis and an acute angle with the front side of the housing. The tip is movable along the front side behind an elongated light-transmitting prism which permits direct observation of a portion of the tip and is provided with a mirrored surface which reflects the image of the tip toward the front side of the housing. An opaque edge face of the prism separates the reflected image from the directly observable portion of the tip.

3,637,287

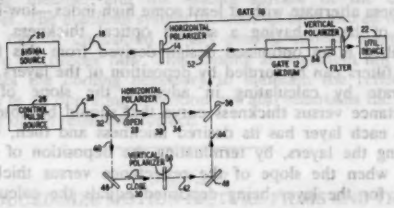
METHOD AND APPARATUS FOR CONTROLLING AN OPTICAL GATE UTILIZING OPTICALLY INDUCED BIREFRINGENCE

John Wilfred Hansen, North Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Aug. 19, 1970, Ser. No. 65,055
Int. Cl. G02f *1/24*
U.S. Cl. 350—147 **14 Claims**

The opening time or framing time of an optical gate, which comprises a pair of crossed polarizers and disposed therebetween a medium in which birefringence can be optically induced, is reduced by applying sequentially to the medium first and second high intensity, fast rise time, orthogonally polarized optical control pulses delayed with respect to one another by a time Δt corresponding to the desired opening time of the gate. The first pulse opens the gate, i.e., induces birefringence in the gate medium and

thereby permits an optical signal to be gated to pass through both polarizers. At a time Δt later the second pulse closes the



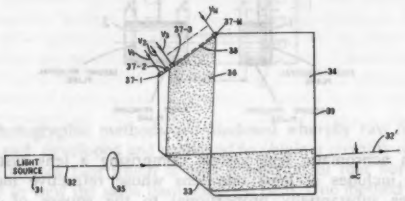
gate, i.e., cancels the birefringence induced by the first pulse thereby causing the optical signal to be absorbed by one of the polarizers.

3,637,288

SINGLE ACOUSTIC FREQUENCY OPTICAL DEFLECTOR

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories Incorporated, Berkeley Heights, N.J.

Filed Feb. 5, 1970, Ser. No. 8,951
Int. Cl. G02f *1/24*
U.S. Cl. 350—149 **8 Claims**



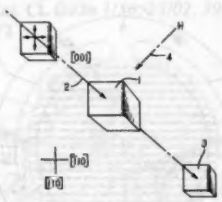
An optical beam deflector is described in which a portion of the incident beam is deflected through a variable angle whose magnitude is determined by the direction of propagation of a substantially constant frequency acoustic beam.

3,637,289

DEVICES BASED ON INDUCED DICHROISM

Joseph F. Dillon, Jr., Morris Township, Morris County; Ernst M. Gyorgy, Madison, and Joseph P. Remeika, Somerset, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Mar. 7, 1969, Ser. No. 805,230
Int. Cl. G02f *1/18*
U.S. Cl. 350—151 **6 Claims**



Dichroism for light as well as magnetic anisotropy may be optically induced in a crystalline material manifesting spontaneous magnetic polarization within which a magnet cation of a valence state other than the nominal value is permitted and within which such an ion may occupy either of at least two crystallographically equivalent but magnetically in equivalent sites. An example of such a material is silicon-doped YIG in which Fe^{2+} may occupy any of four octahedral sites. Devices based on this phenomenon are described.

3,637,290

OPTICAL DATA PROCESSOR PROVIDING ALL RANGE TRACKING AND ALL RANGE FOCUSING

Adam Kozma, Ann Arbor; Emmett N. Leith, Plymouth, and Norman G. Massey, Ypsilanti, all of Mich., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 1, 1965, Ser. No. 510,992
Int. Cl. G02b *5/18*
U.S. Cl. 350—162 SF **2 Claims**

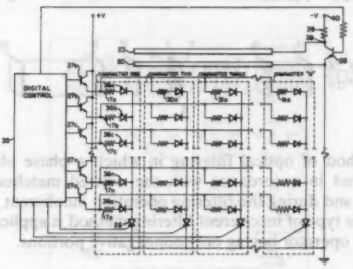
An optical data processor for Doppler radar information stored on a film uses a four-lens telescopic optical system to cause the azimuth target histories to come to focus on a plane surface where they can be recorded. To provide all range focus with this system, two of the lenses are cylindrical lenses to provide a two-lens telescopic system in the range dimension with different magnifications in the two dimensions. The input and output films are tilted with respect to the optical axis to provide all range focusing and all range tracking in the same output plane.

3,637,291

DISPLAY DEVICE WITH INHERENT MEMORY

Clarence W. Kessler, and Theodore T. Trzaska, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Feb. 11, 1970, Ser. No. 10,522
Int. Cl. G02f *1/28*; G09f *11/00*
U.S. Cl. 350—160 **5 Claims**



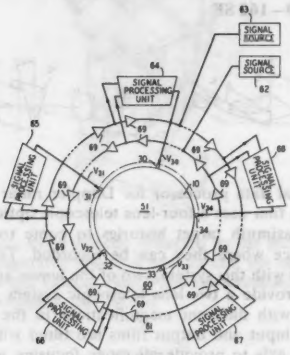
A visual display device utilizing encapsulated liquid crystals as the image-containing medium, the encapsulated liquid crystals evidencing two chromatic states; i.e., a first translucent state and a second opaque state.

The encapsulated liquid crystals serve as the image-containing medium (display screen) of the display device, and writing is accomplished by first rendering the encapsulated liquid crystals translucent by the application of a momentary electrostatic field and the erasing of selected areas of translucency by raising the temperature of selected areas of the encapsulated liquid crystals by the selective application of heat and allowing the subsequent cooling thereof, thereby transposing the selected translucent areas into opaque areas. The temperature must be sufficient to cause the transition of the encapsulated liquid crystals into an isotropic liquid. The point at which this transition occurs is known as the clear point. The images manifest themselves in the eyes of a viewer as a color, the color being determined by the wavelength of the incident light reflected by the opaque areas.

3,637,292
ACOUSTO-OPTICAL DISPLAY DEVICE

Harold Seidel, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed July 25, 1969, Ser. No. 844,960
Int. Cl. G02f 1/28; G09f 11/00
U.S. Cl. 350—161 **9 Claims**

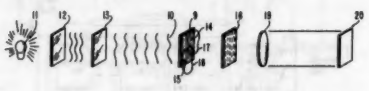


A display is formed by directing an optical beam onto an acousto-optical medium having a single small region of substantial strain which is caused to traverse the medium controllably.

3,637,293
KINOFORM MATCHED FILTER METHOD

Adolf W. Lohmann, La Jolla, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,258
Int. Cl. G06g 9/00; G02b 27/38
U.S. Cl. 350—162 SF **5 Claims**

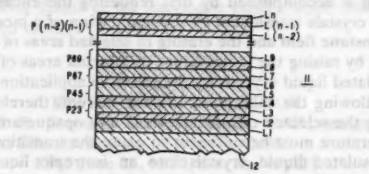


A method of optical filtering in which a phase object is constructed in accordance with the desired matched filter operator and during the filtering operation incoherent light is used. This type of incoherent filtering method is applicable to any filter operator having only nonnegative portions.

3,637,294
INTERFERENCE FILTER WITH ALTERNATELY DESIGNED PAIRS OF DIELECTRIC LAYERS

John W. Berthold, III, Tucson, Ariz., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 19, 1969, Ser. No. 886,721
Int. Cl. G02b 5/28
U.S. Cl. 350—166 **10 Claims**

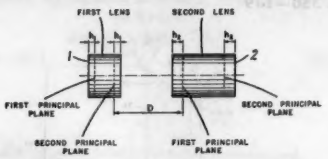


This filter comprises a plurality of superimposed layers in which layers of a first material having a first index of refraction alternate with layers of a second material having a second index of refraction, thereby defining a plurality of high-index—low-index pairs of layers, and at least some high-index—low-index pairs of layers having a first optical thickness alternate with at least some high-index—low-index pairs of layers having a second optical thickness. Also described is an optimized design derived from this filter. Such filters can be formed by deposition of the layers on a substrate by calculating in advance the slope of the reflectance versus thickness curve that should be observed when each layer has its desired thickness and then, when forming the layers, by terminating the deposition of each layer when the slope of the reflectance versus thickness curve for the layer being deposited equals the calculated slope.

3,637,295
ACHROMATIC LENS SYSTEM

Hiroyoshi Matsumura, Osaka-shi; Shogo Yoshikawa, and Ryuji Tatsumi, both of Tokyo-to, all of Japan, assignors to Nippon Selfoc Kabushiki Kaisha (aka Nippon Selfoc Co. Ltd.), Tokyo-to, Japan

Filed Dec. 29, 1969, Ser. No. 888,947
Int. Cl. G02b 1/00, 9/10
U.S. Cl. 350—230 **2 Claims**

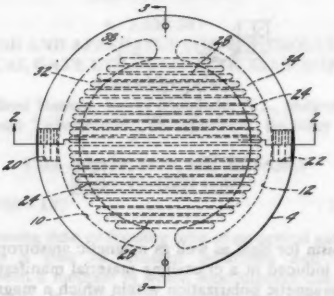


An achromatic lens system comprising a lens system which includes at least one lens whose refractive index changes substantially proportional to the square of the distance from a central axis of the lens toward the surface thereof and whose both end planes are perpendicular to said central axis, lenses constituting said lens system being disposed in coaxial relation so as to substantially eliminate the chromatic aberration of the lens system.

3,637,296
COOLING MEANS FOR REFLECTING DEVICE

George H. McLafferty, Manchester, and George R. Wisner, Deep River, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 4, 1970, Ser. No. 43,493
Int. Cl. G02b 5/08
U.S. Cl. 350—310 **10 Claims**



This reflecting device is for use wherein the reflecting surface is subjected to heat and includes a thick backing member with channels on one surface thereof with one surface of a cover member fixed to said channeled surface forming passages. A reflecting surface is formed on the other sur-

face of the cover member and a manifold system directs a coolant through the passages formed by the channels of the backing member and the mating surface of the cover member. The manifold system includes an inlet and an outlet which can be connected to any desired control means to achieve the proper flow. This cooling arrangement not only provides the cooling necessary to maintain the reflecting device in an operating condition but also maintains the high quality of the reflecting surface.

3,637,297

REDUCED-SIZE MOTION PICTURE FILMS AND THE PHOTOGRAPHING AND PROJECTION THEREOF

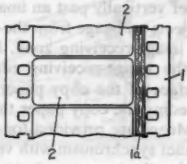
Shigeo Yoshida, No. 406, Chyohuunoki-machi, Ota-ku, Tokyo, Japan

Continuation of application Ser. No. 515,092, Dec. 20, 1965, now abandoned. This application Jan. 21, 1970, Ser. No. 4,438

Claims priority, application Japan, Dec. 21, 1964, 39/71799; June 10, 1965, 40/34258; Oct. 30, 1965, 40/66388

Int. Cl. G03b *37/06*

U.S. Cl. 352—38 **14 Claims**



Photographic methods are disclosed whereby raw film is exposed, developed and projected to obtain a quantity of motion picture film which is only a fraction of that normally used to view the same photographed field. One method comprises producing successive, anamorphic images on a raw film which are compressed in only one direction with substantially no spacing existing between successive images and then developing and printing the raw film to obtain positive film having similarly sized images. Another method comprises producing successive, anamorphic images on a raw film which are compressed equally in two perpendicular directions with substantially no spacing existing between successive images and then developing and printing the raw film to obtain a positive film having similarly dimensioned images.

3,637,298

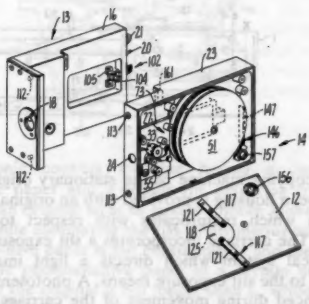
MOTION-PICTURE CAMERA AND THE LIKE

Ernest M. Whitley, Palo Alto, Calif., assignor to Red Lake Laboratories, Santa Clara, Calif.

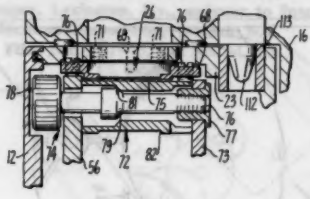
Filed Aug. 11, 1969, Ser. No. 848,961

Int. Cl. G03b *1/50, 23/02, 39/00*

U.S. Cl. 352—72 **15 Claims**



A motion-picture camera adapted for use on aircraft or the like where extreme forces are likely to occur, and in which a rapid exchange mechanism is effected by a two-piece construction with the film gate and associated film drive



mechanism decouplable from the main body of the camera, and in which the film drive mechanism operates with an eccentric drive for providing stop and go motion through a zero clearance gate, the improvements consisting of an improved adjustable zero clearance gate, guides for handling the film through the film gate, and improvements in the two-piece construction including a novel latch mechanism capable of providing a rapid exchange, yet which also positively provides for accurate placement of the film gate in exact focus position.

3,637,299

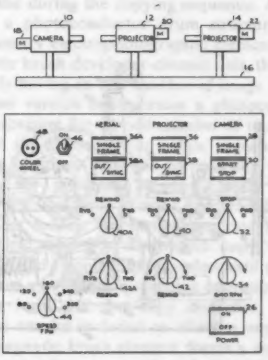
OPTICAL PRINTER

Lawrence W. Butler, 6180 Lumple Hill Road, Los Angeles, Calif., and Roger Banks, Hollywood, Calif., assignors to said Butler, by said Banks

Filed Aug. 17, 1970, Ser. No. 64,547

Int. Cl. G03b *21/32*

U.S. Cl. 352—85 **10 Claims**



An optical printer has a camera and several projectors driven by stepping motors. Provision is made to control these motors so that they may be driven in synchronization or the projector motors may be driven out of synchronization and independently of the camera drive. Provision is also made to insure that the motors always stop in a predetermined home position, get up to full speed after rotating through a predetermined arc and begin to slow down with a predetermined arc of the home position.

3,637,300

SECURITY CAMERA WITH TAPE INDICATOR

William H. Eacho, Richmond, Va., assignor to Schulmerich Manufacturing Co., Sellersville, Pa.

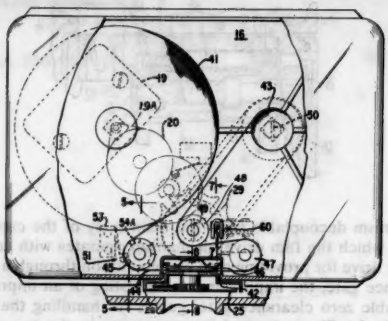
Filed June 29, 1970, Ser. No. 50,666

Int. Cl. G03b *17/46*

U.S. Cl. 352—121 **11 Claims**

A magazine-type camera has a drive mechanism including a clutch assembly interposed between the takeup reel in the

magazine and the drive motor. The film is guided past a lens opening in the magazine by means of three sprockets with a



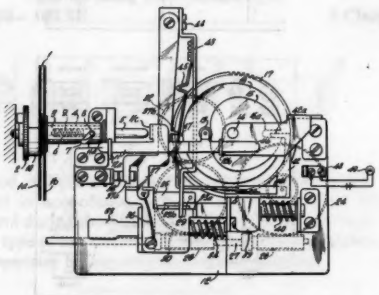
film counter being actuated by one sprocket and a film exhaustion indicator being actuated by an edge of the film passing between the other two sprockets.

3,637,301

MOTION PICTURE CAMERA FADEOUT FADE-IN MECHANISM

Yasuhiko Nakayama, Suwa, Japan, assignor to Kabushiki Kaisha Yashica, Tokyo-to, Japan

Filed Feb. 18, 1970, Ser. No. 12,212
Claims priority, application Japan, July 1, 1969, 44/51493
Int. Cl. G03b 9/10
U.S. Cl. 352—217 **9 Claims**



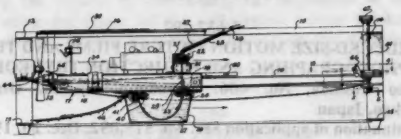
A motion picture camera automatic fade-in fadeout mechanisms includes a variable-exposure aperture shutter and selectively operable means for closing the aperture with the advance feed of a predetermined length of film while disabling the film takeup. Upon closure of the aperture the drive motor is automatically stopped and then selectively energized in a reverse direction to retract the advanced predetermined length of film and thereafter the motor is energized in an advance direction and the mechanism actuated to open the aperture during the advance of said predetermined length of film an normal photography is then effected. The shutter includes a pair of blades having overlapping openings and being angularly adjustable to vary the area of opening overlap. The aperture-varying mechanism includes a heart-shaped cam advanced 180° to close the the aperture, stop during film retraction and rotated 180° to open the aperture. A drive motor shorting and reversing switch responds to the position of the aperture control mechanism.

3,637,302

COMPACT COPYING MACHINE WITH MULTIPLE-FUNCTION RECIPROCATING CARRIAGE

Robert A. Hunt, Silver Creek, and Joseph M. Rait, Buffalo, both of N.Y., assignors to Pelorex Corp., Buffalo, N.Y.

Filed July 19, 1968, Ser. No. 746,127
Int. Cl. G03g 15/22
U.S. Cl. 355—8 **8 Claims**



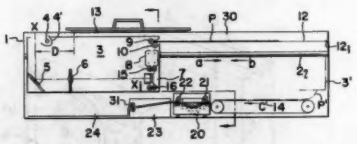
A copying machine of the Electrofax type having a stationary horizontal transparent support for receiving manuscript to be copied and a carriage mounted for horizontal movement beneath the transparency to effect optical scanning of the manuscript. The carriage supports means for feeding copy paper vertically past an image-receiving zone, a mirror which projects an image from the manuscript horizontally toward the image-receiving zone, lens means between the mirror and the image-receiving zone for focusing the image on the surface of the copy paper, a toner receptacle and means for feeding the copy paper therethrough after exposure thereof. Means are provided for moving the carriage horizontally in exact synchronism with vertical movements of the copy paper whereby a panoramic image from the manuscript is applied to the copy paper. The carriage-moving means includes a pulley mounted upon and rotated jointly with a paper feed roll and a traction cable wrapped about the pulley and adapted to be connected to opposite ends of the machine. Means are provided for tightening the cable whereby rotation of the pulley causes the pulley to rotate along the cable and thus move the carriage in synchronism with the paper feed roller.

3,637,303

ELECTROPHOTOGRAPHIC COPYING MACHINE HAVING MOVABLE SLIT-EXPOSURE STATION

Shigehiro Komori, Yokohama-shi, Kanagawa-ken, and Jiro Sato, Kawasaki-shi, Kanagawa-ken, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 17, 1969, Ser. No. 834,095
Claims priority, application Japan, June 21, 1968, 43/43319; Aug. 22, 1968, 43/60163
Int. Cl. G03g 15/04
U.S. Cl. 355—8 **13 Claims**



In a copying machine of the stationary original slit exposure type, a housing is provided with an original holder and a carriage which reciprocates with respect to the original holder. The carriage incorporates a slit exposure means and an optical system which directs a light image from the original to the slit exposure means. A photosensitive member is advanced during movement of the carriage and progressively slit exposed to the original light image and then developed successively.

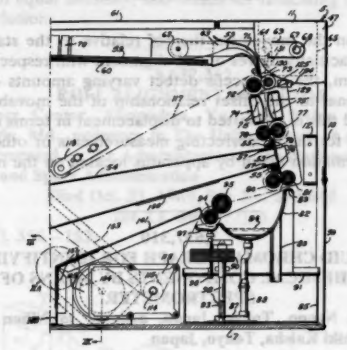
3,637,304
DRYING OF LIQUID DEVELOPED COPY SHEETS IN A COPYING MACHINE

Emil Tiger, Highland Park; Erskine G. Corman, Forest Park, and Kenneth R. Reick, Downers Grove, all of Ill., assignors to Sunbeam Business Equipment Co., Addison, Ill.

Original application Sept. 5, 1967, Ser. No. 665,447, now Patent No. 3,476,479, dated Nov. 21, 1969, which is a division of application Ser. No. 410,549, Nov. 12, 1964, now Patent No. 3,345,926, dated Oct. 10, 1967. Divided and this application July 24, 1969, Ser. No. 844,373

Int. Cl. G03g *13/10, 15/10*

U.S. Cl. 355—10 12 Claims



A flow of drying air in the direction of movement of and under successive individual sheets is provided as they leave development means after exposure in a copymaking machine and from which the exposed sheets are received and free liquid removed before the sheets are engaged by the air. The arrangement is such that the sheets are floated to a copy sheet receptacle.

3,637,305
ELECTRONIC COPYING MACHINE

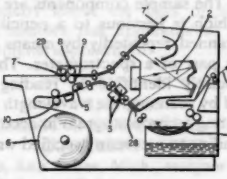
Toyoki Tanaka, Osaka, and Yutaka Irie, Toyokawa City, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 6, 1969, Ser. No. 864,057

Claims priority, application Japan, Oct. 11, 1968, 43/89107; 43/89108

Int. Cl. G03b *29/00*

U.S. Cl. 355—13 12 Claims



An electronic copying machine having a cutter for photosensitive paper and a sensor for detecting front and rear edges of an original so as to ensure smooth movement of the original while eliminating the risk of erroneous operation. The photosensitive paper is fed continuously, and the cutting means cuts the photosensitive paper at a certain minimum length L when the original is not longer than L, while cutting the photosensitive paper at a length corresponding to the length of the original when the original is longer than L.

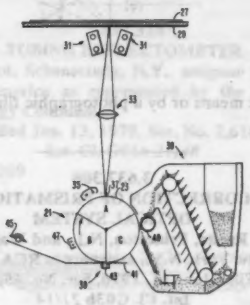
3,637,306
COPYING SYSTEM FEATURING ALTERNATE DEVELOPING AND CLEANING OF SUCCESSIVE IMAGE AREAS ON PHOTOCONDUCTOR

Leon M. Cooper, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1970, Ser. No. 94,262

Int. Cl. G03g *15/00*

U.S. Cl. 355—15 6 Claims



Electrophotographic copying apparatus has charging, imaging, transferring, precleaning, and erasing facilities in a conventional sense but incorporates a combined developing-cleaning unit that is operable to perform either function at the proper time during the copying sequence. A first version incorporates a photoconductor drum structure surrounded with the necessary electrophotographic elements including a single magnetic brush developer-cleaner unit, the drum structure preferably having an odd number of image areas, such as three. Another version incorporates a photoconductor belt also having provision for an odd number of image areas and movable past the stations. For single copy operation, alternate image positions are used for copying with cleaning occurring on the positions between. With the operator changing masters, this delay is not noticeable. With an automatic document feeder, the throughput rate is half of the continuous copy rate. For continuous copy, every image position is used and cleaning is suspended until the end of the run at which time a full cycle cleaning operation is initiated. If the run is long and the copy degrades, intermediate cleanup cycles can be included as often as necessary. Conveniently, a magnetic brush element forms a contacting surface for conveying toner onto the photoconductor surface during developing and away from the photoconductor surface during cleaning. Appropriate changes in biasing of the brush are made during operation.

3,637,307
OPTICAL SYSTEM FOR THE READING OUT STORED INFORMATION

Erich Spitz, Paris, France, assignor to Thomson-CSF

Filed June 18, 1969, Ser. No. 834,406

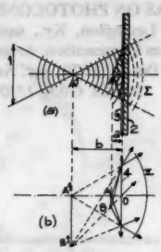
Claims priority, application France, June 25, 1968, 156457

Int. Cl. G03b *27/32*

U.S. Cl. 355—40 12 Claims

The invention relates to optical systems for reading out stored information items carried on a variable transparency support. The information items are juxtaposed on the support and are selectively projected within an aperture by means of holographic imaging means arranged in front of the items; each item can be illuminated by means of a monochromatic

beam supplied by a source of light positioned behind said item. The projected images can be either received by



photoelectric means or by a photographic film on which they are printed.

3,637,308

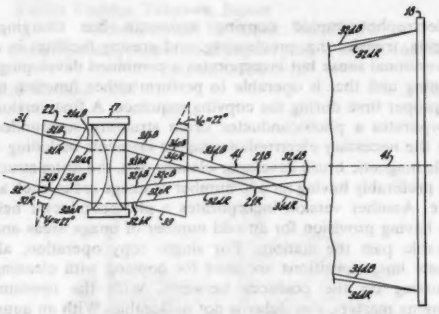
COLOR CORRECTION OF PRISMATIC OFF-AXIS OPTICAL SYSTEM

John A. Van Raalte, Princeton, N.J., and Walter Joseph Gorkiewicz, New York, N.Y., assignors to RCA Corporation

Filed June 11, 1970, Ser. No. 45,311

Int. Cl. G03b *21/14*

U.S. Cl. 353—69 **5 Claims**



Unmodulated, collimated white light is angularly directed to a target reflecting surface which is deformable to represent a subject, and the subject-modulated light reflected from the target surface is directed to a viewing screen by a Schlieren optical system including a projection lens and a stop at the focal point of the lens. A first prism is located between the subject-bearing target surface and the lens to render the light reflected from the target surface orthogonal to the principal plane of the lens and the screen. A second prism is located between the lens and its focal point to effect a color correction of the subject-modulated light reflected from the target surface.

3,637,309

NONCONTACT APPARATUS TO DETERMINE REFERENCE INFORMATION

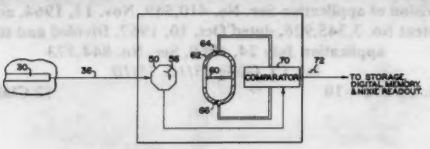
Harry L. Hosterman, 1146 Meadow Spur, Akron, Ohio

Filed Mar. 25, 1969, Ser. No. 810,252

Int. Cl. G01b *11/27*; G01j *1/04*

U.S. Cl. 356—172 **3 Claims**

This apparatus utilizes a fixed laser beam as a reference to determine offset error on a movable platform of a layout machine with reference to a fixed frame carrying the movable platform. Essentially, the invention provides at least two photocells mounted on the movable platform with appropriate optical equipment to receive the laser beam and give equal signal readout when the movable platform is in predetermined offset relationship with the laser beam, indicating a zero position with respect to the reference established by the laser beam. When the movable platform because of inherent mechanical defects in the stationary platform upon the movement thereof relative to the stationary platform actually moves out of alignment with respect to the laser beam, the photocells detect varying amounts of light proportional to the offset relationship of the movable platform, and this is converted to displacement in terms of measurement for use in correcting measurements or other position information taken by apparatus located on the movable platform.



3,637,310

LIQUID CHROMATOGRAPH FOR IDENTIFYING CHEMICAL COMPONENTS BY MEANS OF SPECTROMETER

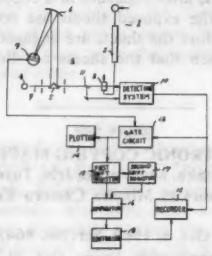
Toyohiko Naono, Tokyo, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1970, Ser. No. 22,949

Claims priority, application Japan, Apr. 1, 1969, 44/25120

Int. Cl. G01j *3/42*

U.S. Cl. 356—83 **5 Claims**



A liquid chromatograph and a method of chromatography for identifying sample components eluated from a chromatographic column. The sample components are passed through a sample cell which is pervious to a pencil of rays whose wavelength is scanned repeatedly by means of a dispersing element forming part of a spectrometer. The sample components are precisely identified by reading an absorption spectrum formed by scanning the wavelength of the pencil of rays, and by plotting a chromatogram in accordance with the signals corresponding to a certain specified wavelength of the scanning range.

3,637,311

OPTICAL DICHROISM MEASURING APPARATUS AND METHOD

Donald G. Tipotsch, Sunnyvale, Calif., assignor to Durrum Instrument Corporation, Palo Alto, Calif.

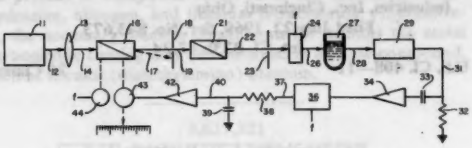
Filed Oct. 30, 1967, Ser. No. 679,064

Int. Cl. G01n *21/40*

U.S. Cl. 356—114 **2 Claims**

An apparatus and method in which a periodic right and left circularly polarized light beam is projected through a sample

in which there are included means for occluding the intensity of said right and left circularly polarized light to form a transmitted light beam having right and left circularly polarized light of equal intensity, and means for indicating the amount of occlusion.

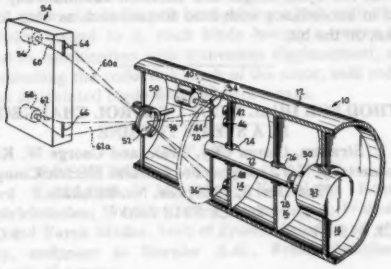


3,637,312

ROLL ALIGNMENT DETECTOR

Clarence Cantor, Alexandria, Va., and Irving B. Lowen, Bowie, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 31, 1969, Ser. No. 873,045
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **12 Claims**



A method and apparatus for precisely measuring roll misalignment of a test body with respect to a reference body is presented. Two light sources are provided on the test body. The light sources are focused upon a rotating disc. The light images are intercepted by an aperture on the rotating disc to illuminate detectors behind the disc. Measurement of the angular displacements at the times of detector illumination gives a precise indication of roll misalignment of the body under test. Accurate roll misalignment is measured even in the event that the body under test is displaced laterally in addition to angularly about the light of sight. The unique geometry that enables this apparatus to be insensitive to lateral displacements is presented.

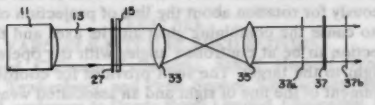
3,637,313

METHOD OF IMAGING TRANSPARENT OBJECTS WITH COHERENT LIGHT

Juris Upatnieks, Ann Arbor, Mich., assignor to Holotron Corporation, Wilmington, Del.

Original application May 12, 1967, Ser. No. 638,031, now Patent No. 3,539,241, dated Nov. 10, 1970. Divided and this application June 26, 1970, Ser. No. 59,862
Int. Cl. G02b *27/22*
U.S. Cl. 356—125 **3 Claims**

A method of improving the quality of images formed by illuminating nondiffuse transparent objects with coherent light, such as in microholography, wherein undesirable noise and grain is appreciably reduced by illuminating the object with coherent light that is characterized in having constant amplitude and random phase. This type of coherent light may be obtained by inserting a phase modulator in the path of the illuminating light in close proximity to the object, the phase modulator acting to scatter the light at very small angles.

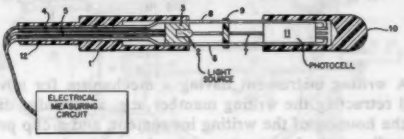


3,637,314

TUBING REFLECTOMETER

Cornelius Groot, Schenectady, N.Y., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 13, 1970, Ser. No. 2,616
Int. Cl. G01n *21/48*
U.S. Cl. 356—209 **1 Claim**



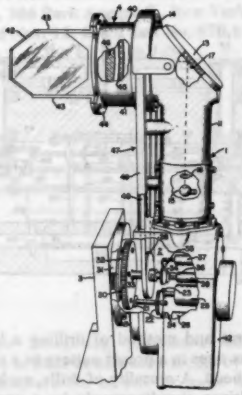
A device for testing the quality of interior walls of tubes, utilizing reflected light inside the tube. The quantity of reflected light in a given section of the tube is measured by means of a photocell and displayed externally of the tubing. The device is movable within the tubing so that all sections of the tubing can be tested.

3,637,315

DIRECT REFLECTING SIGHT

Kennard W. Harper, Endwell, N.Y., assignor to General Electric Company

Filed Sept. 10, 1969, Ser. No. 856,705
Int. Cl. G02b *23/10*
U.S. Cl. 356—251 **7 Claims**



A direct sight instrument permitting wide angle viewing of a target area with a minimal movement by the operator.

Coordination of sight and weapon is provided by means of a combining glass to collimate an illuminated reticle with the direct observation of a target. The combining glass is supported for arcuate movement about a remote axis and simultaneously for rotation about the line of projection of the reticle to cause the combining glass and its axes and the reticle reflection to be at controlled angles with the operator's line of sight to the target. The sight provides for coordination of movement of the line of sight and an associated weapon.

3,637,316

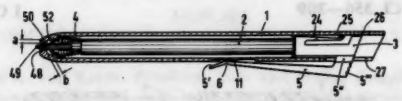
WRITING TOOL

Helmut Bross, Biberttalstrasse 24, Altenberg near Nuremberg, Germany

Continuation of application Ser. No. 758,829, Sept. 10, 1968, now abandoned. This application May 21, 1970, Ser. No. 41,666

Int. Cl. B43k *5/16*

U.S. Cl. 401—104 **12 Claims**



A writing instrument having a mechanism for advancing and retracting the writing member, e.g. a cartridge disposed in the housing of the writing instrument, and a clip provided laterally on the housing to secure the writing instrument to a pocket. The mechanism is so constructed that the retraction of the writing member can be effected optionally by actuating a pushbutton provided on the rear end of the housing or by lifting the clip in relation to the longitudinal axis of the housing.

3,637,317

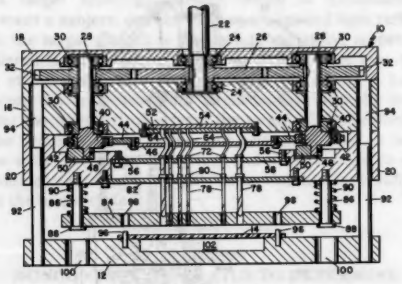
METHOD AND APPARATUS FOR DRILLING MULTIPLE HOLES

Paul E. Pomeroy, 5424 Diane Ave., San Diego, Calif., and Lucia B. Dixon, 8515 Sandstone Drive, Santee, Calif.

Filed Sept. 2, 1969, Ser. No. 854,508

Int. Cl. B23b *35/00, 39/16*

U.S. Cl. 408—1 **13 Claims**



A drilling unit and method of drilling a large number of holes of various sizes in a preset pattern in a single movement of the drilling head. A plurality of drills, each having a crank portion, are driven simultaneously by a common eccentric mechanism. The drills can be very closely spaced and are individually removable and replaceable without disturbing the overall arrangement.

3,637,318

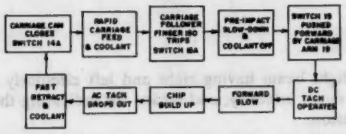
DRILLING APPARATUS

Richard H. Hayes, Tallmadge, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed July 22, 1969, Ser. No. 843,673

Int. Cl. B23b *47/24*

U.S. Cl. 408—11 **25 Claims**


CARRIAGE CAM CLOSES SWITCH 14A
RAPID CARRIAGE FEED & COOLANT
CARRIAGE FOLLOWER FINGER ISO TRIPS SWITCH 16A
PRE-IMPACT SLOW-DOWN & COOLANT OFF
SWITCH 19 PUSHED FORWARD BY CARRIAGE ARM 19
FAST RETRACT & COOLANT
AC TACH DROPS OUT
CHIP BUILD UP
FORWARD SLOW
DC TACH OPERATES

A drilling apparatus for drilling holes of predetermined depth in a workpiece including a drill head assembly disposed for angular orientation with respect to the workpiece. The assembly comprises a drill mechanism including a powered drill bit with controls for automatically controlling rotational speed of the bit. The drill mechanism is moved axially into and out of engagement with the workpiece by a drill control mechanism including a fluid motor unit with controls for automatically controlling the feed rate of the bit, such as rapid forward feed, intermediate forward feed, reduced constant cutting feed and rapid retraction feed, in each cycle, and with the cycle length and duration automatically determined in accordance with load forces, such as chip load or the like, on the bit.

3,637,319

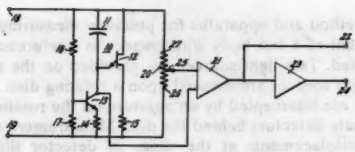
METHOD FOR DUAL MODE CONTROL CHANGEOVER IN A STEAM TURBINE

Jerry L. Stratton, Canon City, Colo., and George W. Kessler, Schenectady, N.Y., assignors to General Electric Company

Filed Dec. 8, 1969, Ser. No. 883,221

Int. Cl. F01d *7/00*

U.S. Cl. 415—1 **3 Claims**



A dual mode control system is disclosed wherein the changeover from one mode to the other is made by the use of time ratio switching. A pulse generator produces a series of pulses whose duty cycle varies from zero to 100 percent and controls a switching element to accomplish the changeover in accordance with the percent duty cycle.

3,637,320

COATING FOR ASSEMBLY OF PARTS

Gene F. Wakefield; Carl D. Reedy, Jr., both of Richardson, and John A. Bloom, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1968, Ser. No. 788,326

Int. Cl. B23k *31/02;* **B23p** *3/00;* **C23c** *11/08*

U.S. Cl. 415—200 **34 Claims**

Metal carbonitride coatings are deposited on assemblies, the parts of which are connected by an adherent material by first heating a selected assembly, including the adherent material, and subsequently contacting the assembly with a gaseous stream which will yield reactive hydrogen, nitrogen, carbon, and a selected metal, upon contact with the heated assembly. The gaseous stream may, for example, contain

hydrogen, nitrogen, titanium tetrachloride, and a carbon-containing compound such as methane, or the hydrogen may be present in compound form, as in the system dimethylhydrazine, nitrogen, and titanium tetrachloride. Alternatively, the necessary reactive constituents for forming the metal carbonitride coating may be contained in a single compound, such as tetrakis (dimethylamino) titanium.

3,637,321

TAIL ROTOR OF A HELICOPTER

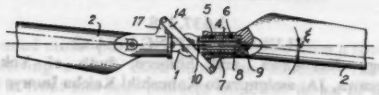
Andrei Vladimirovich Nekrasov, ulitsa Stromynka 23, kv. 136a, and Lev Naumovich Grodko, Pokrovsky balvar, 14/6, kv. 14, both of Moscow, U.S.S.R.

Filed Oct. 2, 1969, Ser. No. 863,156

Claims priority, application U.S.S.R., Dec. 4, 1968, 1286831

Int. Cl. B64c *27/76*

U.S. Cl. 416—123 **3 Claims**



A tail rotor of a helicopter comprising a hub with at least two blades hinged to it, each blade having a sweep angle selected in combination with transverse displacement, and a rod controlling the collective pitch of the rotor, said rod carrying an articulated blade-pitch control means.

3,637,322

ROTOR HEAD FOR A HELICOPTER

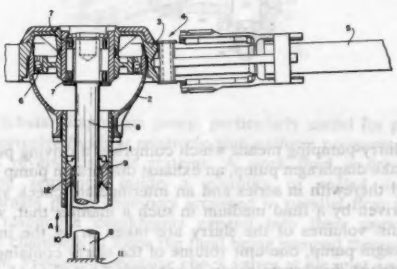
Gerhard Kannamuller, Markdorf; Karl-Heinz Kosziech, Friedrichshafen; Werner Goller, Bermatingen; Walter Kugler, and Yorck Muller, both of Friedrichshafen, all of Germany, assignors to Dornier A.G., Friedrichshafen am Bodensie, Germany

Filed Feb. 12, 1970, Ser. No. 10,744

Claims priority, application Germany, Feb. 26, 1969, P 19 09 501.3

Int. Cl. B64c *27/52*

U.S. Cl. 416—138 **3 Claims**



This invention relates to a rotor head for a helicopter comprising a hollow rotor mast, ball end means mounted on the mast, spring rod means mounted in the mast, ball socket means having rotor blades secured thereto on one end of said spring rod means and the other end thereof being secured against rotation, and a longitudinally displaceable supporting means between the hollow mast and the spring rod means.

3,637,323

VARIABLE-PITCH BLADED ROTORS

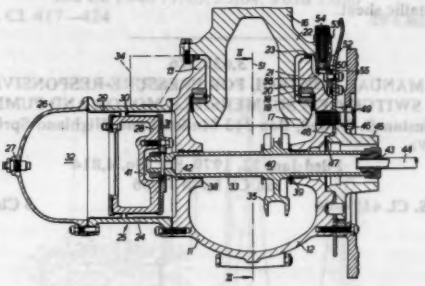
John Alfred Chilman, Painswick; Alfred Herbert Walter Loynes, Tewkesbury, and Peter Spence, Cheltenham, all of England, assignors to Dowty Rotol Limited, Gloucester, England

Filed June 18, 1969, Ser. No. 834,297

Claims priority, application Great Britain, July 8, 1968, 32,404/68

Int. Cl. B64c *11/40*

U.S. Cl. 416—139 **3 Claims**



A variable-pitch bladed rotor having a pitch-change motor which includes a casing and a diaphragm device which together define on one side of the device a closed chamber for fluid under pressure, and on the other side of the device an actuator chamber. Means are provided for varying the pressure of fluid in the actuator chamber, and means are connected to the diaphragm device for transferring movement thereof, consequent upon such variation in pressure, to the blades to vary their pitch.

3,637,324

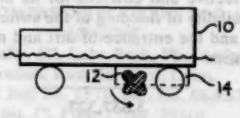
VEHICLE PROPULSION-ASSISTING SYSTEMS

Anatole J. Sipin, 386 Park Avenue S., New York, N.Y.

Filed Nov. 12, 1969, Ser. No. 870,177

Int. Cl. B63h *1/04*

U.S. Cl. 416—146 **13 Claims**

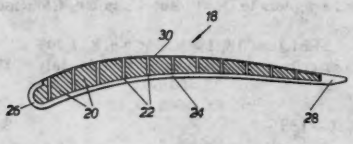


A system for increasing propulsive effectiveness of wheeled vehicles in fluid or soft solid media by pneumatically varying the characteristics of one or more driving wheels. The contour of the outer surface of the wheel is varied between a circular shape and a shape which includes one or more pairs of alternately indented and raised segments by adjustment of fluid pressure within the wheel.

3,637,325
BLADE STRUCTURE

John Godfrey Morley, Little Eaton, England, assignor to Secretary of State for Defense, London, England

Filed Dec. 2, 1969, Ser. No. 881,551
Int. Cl. F01d 5/14
U.S. Cl. 416—230 3 Claims

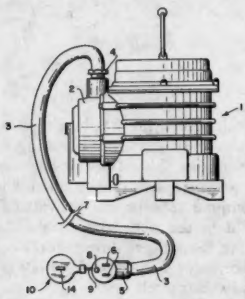


A composite blade for use in gas turbine engines has a core formed by spanwise fiber reinforced members separated by metallic strips, the core being at least partially covered by a metallic sheet.

3,637,326
MANUAL CONTROL FOR PRESSURE-RESPONSIVE SWITCH OF A SUBMERSIBLE MOTOR AND PUMP

Winston C. Dowell, Box 313 Mullen Lane, Highland Springs, Va.

Filed Jan. 22, 1970, Ser. No. 4,814
Int. Cl. F04b 49/06
U.S. Cl. 417—44 3 Claims



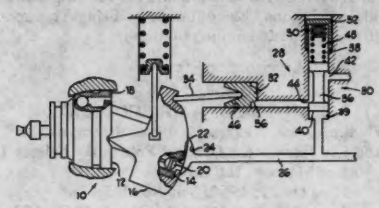
Device for manual control of a pressure-responsive switch of a motor driving a submerged pump, irrespective of hydraulic pressure effective upon the switch. A sealed flexible bellows is pneumatically connected at ground level, into the tubular conduit including current-conducting cables extending to the submerged pressure-responsive switch of the motor, and enables reduction of pressure effective upon the switch to energize the motor when desired. The sealed bellows, while effective and efficient for its intended purpose, avoids the possibility of flooding of the switch, water damage to the motor, and the entrance of dirt and moisture into the switch mechanism.

3,637,327
PUMP

Emil A. Kubiak, Novelty, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,067
Int. Cl. F04b 49/00, 1/26
U.S. Cl. 417—222 1 Claim

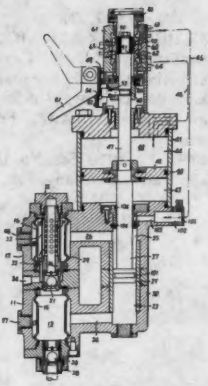
A variable displacement pump is provided with a temperature compensated displacement compensator valve adjusted to obtain a desired constant pressure output under variable fluid medium temperature conditions. The valve incorporates, in addition to spring biasing means, temperature responsive means which vary the force applied to the spring in response to temperature changes in the environment.



3,637,328
SLURRY-PUMPING MEANS

Akitsugu Kurokawa, and Shigeru, both of Yokohama Maezawa, JA, assignors to Kabushiki Kaisha Inouye Shokai (Inouye & Co., Ltd.), Yokohama, Japan

Filed June 24, 1970, Ser. No. 49,384
Claims priority, application Japan, Feb. 26, 1970, 45/16119
Int. Cl. F04b 3/00, 43/06, 15/02
U.S. Cl. 417—246 7 Claims



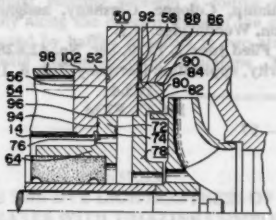
A slurry-pumping means which comprises a driving pump, an intake diaphragm pump, an exhaust diaphragm pump connected therewith in series and an intermediate check valve, and driven by a fluid medium in such a manner that, while two unit volumes of the slurry are taken in by the intake diaphragm pump, one unit volume of the slurry contained in the exhaust diaphragm pump is exhausted out thereof, and, while the intake diaphragm pump does not take in the slurry, one unit volume previously taken in by the intake pump is exhausted from the exhaust pump and the other one unit volume previously taken in by the intake pump is accumulated in the exhaust pump and becomes the first-named one unit volume. By virtue of the above operating manner and a construction adapted thereto, the output becomes continuous with a uniform pressure. Various means for operation and maintenance thereof are also disclosed.

3,637,329

PUMP

Ryuichi Sato; Seizi Harimaya; Akihiko Agata; Kunio Morishima; Toshiaki Isutsui, and Yasuhiro Kano, all of Tokyo, Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan

Filed June 1, 1970, Ser. No. 42,250
Claims priority, application Japan, May 29, 1969, 44/41940
Int. Cl. F04b *17/00, 35/00*
U.S. Cl. 417—360 3 Claims



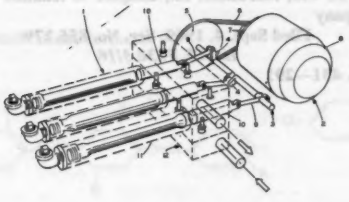
A canned motor pump has a stator sealed from a rotor, the rotor driving a shaft that carries an impeller. The shaft rotates in front and rear bearings while the thrust of the impeller is balanced by fluid passing through an orifice plate behind the impeller. A front bearing housing is separate from but interconnected with the orifice plate by an adapter. The stator may be externally heat exchange jacketed, while a guide disc may be carried by the front bearing housing to direct fluid radially inwardly toward the intake of an auxiliary impeller.

3,637,330

MULTICHAMBER TUBULAR DIAPHRAGM PUMP

Richard W. Goeldner, New Berlin, Wis., assignor to Aqua-Chem, Inc.

Filed Nov. 21, 1969, Ser. No. 878,715
Int. Cl. F04b *9/08, 35/02, 45/02, 43/06*
U.S. Cl. 417—389 16 Claims



A tubular diaphragm pump, particularly useful for pumping corrosive fluids at relatively high-uniform pressures, such as in reverse osmosis systems. A work fluid is driven in phased sequence inside a plurality of sealed tubular diaphragm pump chambers arranged in parallel flow paths. The respective diaphragms expand into their associated pump chambers to force the fluid being pumped through the system. Pressure-responsive check valves at the inlet and outlet of each pump chamber open and close in phased sequence to control flow. A drive mechanism which is sealed off from the fluid being pumped is provided to drive the work fluid which flexes the diaphragms.

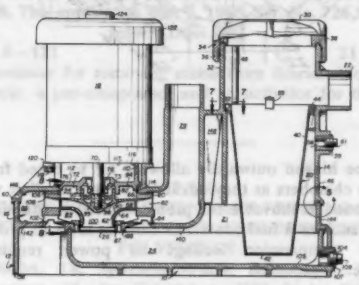
The flexible tubular diaphragms are disposed on cylindrical members having wider end portions and perforated intermediate wall portions of lesser diameter than the adjacent end portions. The cylindrical members each have a central chamber which communicates with the internal surface of the associated tubular diaphragm through the perforations in the intermediate wall portion. Each central chamber is also in communication with a piston chamber containing a reciprocating drive piston. The pistons are connected to reciprocate in phased sequence. The central chambers and the piston chambers are filled with a hydraulic work fluid which flexes the tubular diaphragms when the pistons reciprocate. In at least one embodiment, the cylindrical members supporting the tubular diaphragms each include an integral end extension defining the piston chamber. The cylindrical members also serve as tie rods for the pump assembly.

3,637,331

SELF-CONTAINED PUMPING UNIT

Wilbur C. Smith, N. Caldwell, and Philip Joseph Nagengast, Plainfield, both of N.J., assignors to Worthington Corporation, Harrison, N.J.

Filed June 1, 1970, Ser. No. 42,128
Int. Cl. F04b *17/00, 35/04;* F01d *15/00*
U.S. Cl. 417—424 29 Claims



A self-contained pumping unit, fabricated primarily from plastic materials, has pump apparatus and filter apparatus formed as integral parts of a single structure. The self-contained pumping unit includes a base member which communicates the pump apparatus to the filter apparatus. Additionally, the base member incorporates a mount for the pump drive motor and a pump discharge conduit. The relative positioning of the filter apparatus to the pump base member and other structural features of the unit provide the unit with self-venting, self-draining, and self-priming characteristics. The design of the pumping unit allows for the fabrication of the structure by modern plastic molding techniques, thereby allowing the use of noncorroding and chemically inactive materials in all the surfaces of the structure which are to be exposed to the liquid to be pumped. A special design is used to mate the individually molded parts of the pumping unit to form a single structure having high strength and rigidity.

3,637,332

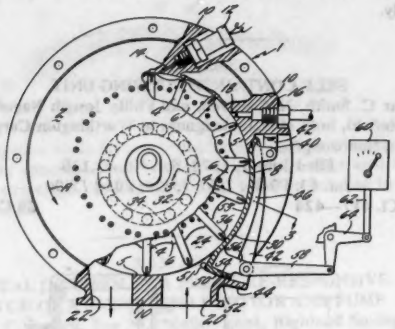
VARIABLE COMPRESSION MEANS FOR A ROTARY ENGINE

William J. McAnally, III, Lake Park, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed July 38, 1970, Ser. No. 58,937
Int. Cl. F04c *15/04, 29/10*
U.S. Cl. 418—159 2 Claims

A vaned rotary-type engine having a rotor assembly mounted for rotation within a cylindrical surface, said rotor assembly being eccentrically mounted with vanes forming chambers therebetween. The rotation of the vanes continuously varies the size of the chambers around the cylindrical surface between a maximum size at an air inlet to a minimum size at a point approximately 180° therefrom where a com-

bustible mixture which has been formed is ignited. The size of the chamber then increases to the exhaust outlet approximately 180° therefrom. To control the compression ratio and the amount of air being compressed a section of the cylindrical surface on the compression side is made movable so that



it can be hinged outwardly allowing air to bleed from the variable chambers as they advance to their smallest volume. This section is movable for predetermined positioning by a control such as a fuel control or throttle lever to provide increased compression leakage as power requirements decrease.

3,637,333

GEAR-TYPE FLUID MOTOR OR PUMP

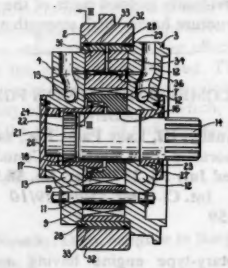
Kenneth Raymond Dixon, and David Burnett Sugden, both of Kingston Beach, Australia, assignors to Improved Mechanical Products Pty. Ltd., Tasmania, Australia

Filed Oct. 18, 1968, Ser. No. 768,820

Claims priority, application Australia, Oct. 23, 1967, 28809/67

Int. Cl. F01c *17/00, 1/08*

U.S. Cl. 418—182 **38 Claims**



This invention relates to a motor or pump of the gear-type including a housing containing a main gear and at least one pinion gear meshing with the main gear. A coupling means drivably engages with the main gear and is drivably engageable with a rotatable member which is driven or driving according to whether the unit is used as a motor or pump. The coupling means is such that the respective rotational axes of the main gear and the driven or driving member may be misaligned during use.

3,637,334

COMBINED FLAME HEIGHT ADJUSTING AND GAUGING MECHANISM

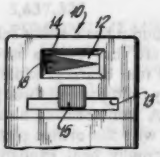
Herman Schlamp, Cologne, Germany, assignor to Ronson Corporation, Woodbridge, N.J.

Filed June 2, 1970, Ser. No. 42,626

Claims priority, application Germany, July 8, 1969, P 19 35 163.4

Int. Cl. F23d

U.S. Cl. 431—17 **14 Claims**



A burner valve adjustment mechanism, wherein the valve adjustment is combined with an indicator enabling the user to gauge the height of the flame by observing the indicator through a window.

3,637,335

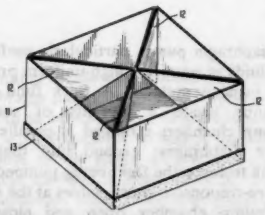
SOLID FUEL BLOCK HAVING A SELF-CONTAINED WICK

George A. Uhl, Markham, Ill., assignor to Atlantic Richfield Company

Filed Sept. 4, 1969, Ser. No. 855,279

Int. Cl. F23d *3/16*

U.S. Cl. 431—291 **3 Claims**



A solid fuel block for use as a heat source in, for example, a fruit orchard, is disclosed. The solid fuel block is composed of a single, folded container enclosing a solid hydrocarbon fuel on the bottom and four sides. The folded-in corners of the container extend into the fuel and act as a wick.

3,637,336

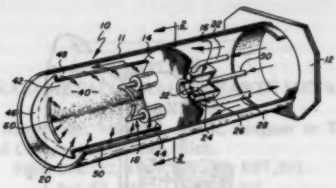
OPPOSED VORTEX COMBUSTION CHAMBER

Wallace W. Velie, Woodland Hills, and Robert D. Scherer, North Hollywood, both of Calif., assignors to North American Rockwell Corporation

Filed Dec. 29, 1969, Ser. No. 888,243
Int. Cl. F23d 15/00

U.S. Cl. 431—351 6 Claims

A combustion chamber for burning fuel oil or the like consists of a tubular housing wherein a source of air is introduced axially along the interior walls of the chamber, the air being directed by baffles inwardly in two streams which flow in opposite circumferential directions. The counter rotating vortices intersect each other within the chamber Fuel is introduced at some point along or near the dividing line of the vortices for uniform fuel-air mixing thereby enhancing the combustion properties of the mixture.



CHEMICAL

3,637,337

IMPROVING THE DYE LIGHTFASTNESS OF ACRYLIC SUBSTRATES WITH TRIAZINE COMPOUNDS

Brian Pilling, 1309 Elizabeth Ave. S.E., Decatur, Ala.

Filed Aug. 3, 1966, Ser. No. 569,796
Int. Cl. D06p 3/00, 5/00, 5/02

U.S. Cl. 8—4 7 Claims

A method of improving the dye lightfastness of acrylic polymer substrates by the incorporation of amino or hydroxy-substituted triazine compounds. Preferred Polymers comprise polyacrylonitrile and copolymers containing at least 80 percent acrylonitrile. Preferred lightfastness agents are triamino triazine and trihydroxy triazine in amounts from about 0.2 percent to about 5 percent, based on polymer weight.

3,637,338

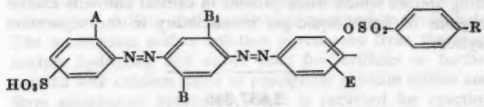
POLYAMIDE FIBER DYED WITH DISAZO-DYESTUFFS

Hans Alfred Stingl, Brookside Heights, Toms River, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.

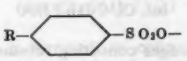
Original application July 10, 1968, Ser. No. 743,630. Divided and this application July 17, 1970, Ser. No. 62,785
Int. Cl. C09b 35/04; D06p 1/06

U.S. Cl. 8—41 1 Claim

Compounds of the formula



wherein A is hydrogen, lower alkyl such as methyl, ethyl or propyl, lower alkoxy such as methoxy, ethoxy or butoxy, or chlorine; B and B¹ are hydrogen, lower alkyl such as methyl, ethyl or butyl, or lower alkoxy such as methoxy, ethoxy, or butoxy; E is hydrogen, lower alkyl such as methyl, ethyl or butyl, or lower alkoxy such as methoxy, ethoxy or butoxy; R is hydrogen, methyl or chlorine and



is either ortho or para to the azo linkage; and SO_3H is either meta or para to the azo linkage, provide yellow to scarlet shades of good fastness and dyeing properties and excellent leveling characteristics on natural and synthetic polyamide fibers.

3,637,339

STAIN REMOVAL

Frederick William Gray, 14 Stockton Road, Summit, N.J.

Continuation-in-part of application Ser. No. 711,203, Mar. 7, 1968. This application May 3, 1968, Ser. No. 726,571
Int. Cl. D06l 3/02

U.S. Cl. 8—111 21 Claims

Composition for removing stains from fabrics, including, an enzyme, a per-compound, and an activator for the perborate.

3,637,340

PROCESS FOR THE DYEING AND PRINTING OF TEXTILE MATERIAL MADE OF HYDROPHOBIC POLYESTERS

Hans Mollet, 18, Spitzackerstrasse, Bottmingen; Helmut Hohenegger, 11, Im Gehracher, 4000 Basle; Karlheinz Keller, 22, Im Esterli, and Rudolf Keller, 32, Kilchgrundstrasse, all of Riehen, all of Switzerland, assignors to Ciba-Geigy A G, Basel, Switzerland

Filed Jan. 28, 1969, Ser. No. 794,771
Claims priority, application Switzerland, Feb. 2, 1968, 1622/68; Nov. 6, 1968, 16521/68
Int. Cl. D06p 5/04

U.S. Cl. 8—166 6 Claims

Process for dyeing or printing textile materials made from hydrophobic polyester fibers with dye liquors or inks containing water-dispersible dyestuff and a liquid auxiliary mixture comprising a fiber-swelling agent such as o-phenylphenol, a protective colloid such as polyvinylalcohol, a water-miscible organic solvent, water and optionally for use in dye liquors containing nonionogenic additives a sulfosuccinate or the like anion-active agent whereby foam formation during dyeing or printing is eliminated or at least greatly reduced.

3,637,341

METHOD AND MEANS FOR CORROSION PROTECTION OF CABLES EXPOSED TO UNDERGROUND ENVIRONMENTS

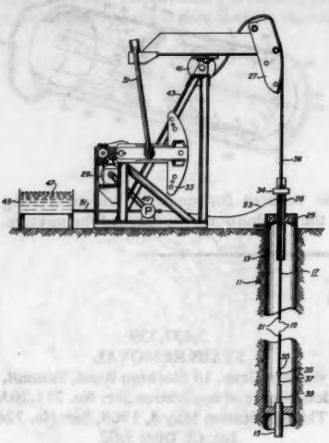
James B. Horton, Bethlehem, and Herbert E. Townsend, Jr., Hellertown, both of Pa., assignors to Bethlehem Steel Corporation

Filed Dec. 29, 1969, Ser. No. 888,551
Int. Cl. C23f 11/00, 11/08

U.S. Cl. 21—2.5 18 Claims

Stranded cable such as flexible pumping strand used for oil wells is protected from deterioration in corrosive underground and underwater environments by jacketing the cable with a plastic sheath and pumping a corrosion-inhibit-

ing liquid having a specific gravity similar to that of the immediate underground environment from the surface through



the strand and out the lower end of the strand while maintaining a slight positive pressure within the strand or cable.

3,637,342

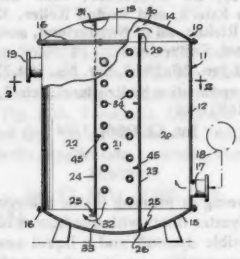
STERILIZATION OF FLUIDS BY ULTRAVIOLET RADIATION

Louis P. Veloz, 500 South Madison St., Pasadena, Calif.

Filed May 7, 1969, Ser. No. 822,474

Int. Cl. A61l *3/00*

U.S. Cl. 21—102 R **7 Claims**



A fluid sterilizer including a pressure vessel through which fluid to be sterilized is directed, and containing at least one partition formed of a material adapted to pass ultraviolet radiation, with a source of such radiation being positioned to emit ultraviolet radiation first through fluid within a compartment at one side of the partition, and then through the partition and into fluid contained within a second compartment at the opposite side of the partition, in a manner assuring maximum utilization of the available radiation.

3,637,343

METHOD FOR INCINERATION OF COMBUSTIBLE MATERIAL IN A CONTINUOUS FLOW OF A GASEOUS MEDIUM

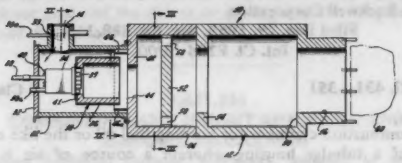
John H. Hirt, Monterey Park, Calif., assignor to Hirt Combustion Engineers, Montebello, Calif.

Filed Apr. 26, 1968, Ser. No. 724,348

Int. Cl. F27b *9/00*

U.S. Cl. 23—2 C **6 Claims**

A method and a fume incinerator apparatus for purifying a continuous flow of waste gas that contains combustible material by incinerating such material. The exemplary incinerator includes a chamber, a fuel-operated burner in the chamber, and flow control means for rapidly and thoroughly



mixing waste gas and the hot gaseous products from the burner for highly effective and efficient incineration of the combustible material.

3,637,344

METHOD OF TREATING EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Charles E. Thompson, Warren, N.J., assignor to Esso Research and Engineering Company

Filed Oct. 23, 1968, Ser. No. 770,080

Int. Cl. B01d *53/34*

U.S. Cl. 23—2 E **9 Claims**

Exhaust gases of internal combustion engines are contacted with a ruthenium-iridium catalyst to provide less objectional products suitable for discharge to the atmosphere. The ruthenium-iridium catalyst has been found to be extremely effective in promoting the removal of nitrogen oxides, carbon monoxide and unburned hydrocarbons from automobile exhaust gases. The catalyst is more effective than catalysts containing either the ruthenium component or the iridium component alone.

3,637,345

PROCESS FOR REMOVING ACID GASES FROM GASCOUS METHOD

Frederic Leder, Elizabeth, N.J., assignor to Esso Research and Engineering Company

Filed May 16, 1969, Ser. No. 825,444

Int. Cl. B01d *53/16, 53/34*

U.S. Cl. 23—2 R **12 Claims**

When using potash or other alkali metal salts such as carbonates, hydroxides, hydrosulfides, sulfides, or bicarbonates to absorb acid gases such as H_2S and CO_2 from gaseous mixtures, unexpectedly high absorption rates are obtained by adding amines which when present in critical amounts exhibit regions of liquid-liquid-gas immiscibility in the separation system.

3,637,346

PROCESS FOR THE TRANSFORMATION INTO USEFUL PRODUCTS OF SLUDGES OBTAINED BY NEUTRALIZATION OF CRUDE PHOSPHORIC ACIDS

Klaus-Peter Ehlers, Hermulheim near Cologne; Heinz Harnisch, Lovenich near Cologne, and Siegfried Lischka, Bruhl-Vochem, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack bei Koln, Germany

Filed Apr. 22, 1969, Ser. No. 818,400

Claims priority, application Germany, May 30, 1968, P 17 67 631.2

Int. Cl. C01b *25/30*

U.S. Cl. 23—107 **10 Claims**

Utilization of sludges consisting substantially of insoluble aluminum and iron phosphates, of the type obtained by neutralization of crude phosphoric acids produced from wet-processed phosphate ores. The sludges are combined with silicic acid-containing compounds, which are added in a quantity one or two times the quantity stoichiometrically needed to produce alkali metal aluminum silicates of the general formu-

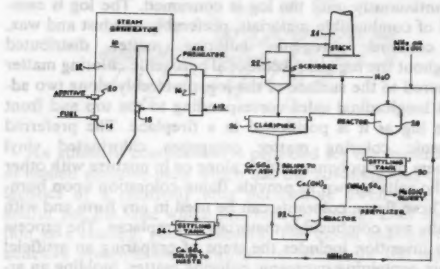
la $Me_2Al_2SiO_6$, in which Me is an alkali metal, and with an alkali liquor, which is added so as to obtain an alkali metal oxide: P_2O_5-molar ratio between 4.0 and 5.0; the resulting suspension is heated to a temperature higher than 90° C., for a period between 30 and 200 minutes, with agitation; phosphoric acid is added so as to produce an alkali metal oxide: P_2O_5-molar ratio between 2.5 and 3.5; the P_2O_5-concentration in the resulting solution is reduced down to six to 10 weight percent by the addition of water or recycled wash solution; the solution is filtered; an insoluble residue consisting of $Fe(OH)_3$ and $Me_2Al_2SiO_6$ is washed out; and the filtrate is used for making alkali metal phosphates.

3,637,347

AIR POLLUTION CONTROL SYSTEM WITH CHEMICAL RECOVERY

James Jonakin, Simsbury, and Arthur L. Plumley, Wapping, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed July 31, 1969, Ser. No. 846,331
Int. Cl. C01f *11/46, 5/40;* **C01c** *1/24*
U.S. Cl. 23—122 **4 Claims**



A system and process is described for treating the effluent chemicals from an air pollution control system for fossil fuel fired equipment. The air pollution control system involves the addition of magnesium-containing additives such as dolomite to the equipment followed by the wet scrubbing of the flue gases resulting in the reaction of the sulfur oxides with the additive. The treatment involves the addition of ammonium hydroxide to the solution removed from the scrubber to convert the soluble magnesium sulfate to soluble ammonium sulfate and precipitate magnesium hydroxide. The ammonium sulfate solution is removed from the magnesium hydroxide and either used for fertilizer or further reacted with calcium oxide to precipitate calcium sulfate and form ammonium hydroxide which is recycled for reaction with the scrubber effluent.

3,637,348

CONTROL OF POSTPRECIPITATION FROM WET PROCESS PHOSPHORIC ACID

John W. Kraus, Fairfax, Va., and Casimer Claudius Legal, Jr., Elkridge, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 24, 1969, Ser. No. 869,319
Int. Cl. C01b *25/22*
U.S. Cl. 23—165 **10 Claims**

This invention is directed to controlling the rate and amount of postprecipitate that forms in merchant grade phosphoric acid by treating the acid with cresylic acid, picoline, pyridine and their homologues. This treatment is useful as a control against postprecipitation in the wet process preparation of phosphoric acid. The use of cresylic acid, picoline, and pyridine, and their homologues has been found to cause rapid precipitation of solids from the phosphoric acid, thereby improving the purity of the phosphoric acid in a shorter period of time than previously possible.

3,637,349

ALKALI METAL-ALKALINE EARTH METAL HYDROXIDES

Robert J. Moolenaar, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 22, 1969, Ser. No. 887,391
Int. Cl. C01f *11/00, 11/02*
U.S. Cl. 23—183 **1 Claim**

A new compound having the general formula of $M_2E(OH)_4$, wherein M is Ea or K and E is Ba or Sr.

3,637,350

METHOD OF INTRODUCING LIQUID QUENCH INTO A CARBON BLACK REACTOR

Warren M. Thomas, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed July 18, 1969, Ser. No. 842,960
Int. Cl. C09c *1/50*
U.S. Cl. 23—209.4 **7 Claims**

Method of introducing a liquid quench into a carbon black reactor to reduce the temperature of the gaseous effluent wherein a gaseous fluid such as steam, nitrogen, or carbon dioxide is used to increase the pressure on the liquid quench and facilitate the dispersal thereof in the gaseous effluent. The method is particularly useful for quenching hot gases in a carbon black reactor in standby operation.

3,637,351

POROUS PARTICULATE SULFUR AND MEANS AND METHOD FOR ITS PREPARATION

Donald C. Young, Fullerton, and Bruce A. Harbolt, Northridge, both of Calif., assignors to Union Oil Company, Los Angeles, Calif.

Filed July 30, 1969, Ser. No. 846,141
Int. Cl. C01b *17/02*
U.S. Cl. 23—224 **4 Claims**

Highly porous sulfur particles are prepared by discharging, into a vapor space at substantially atmospheric pressure, water and molten sulfur in intimate admixture to form sulfur droplets having a continuous sulfur phase and a contained water phase, permitting the sulfur droplets to solidify into discrete particles and the water to separate therefrom. This can be accomplished by discharging molten sulfur and water from separate conduits and into intimate admixture in the atmosphere. The sulfur is solidified into porous particles and the momentum of the combined streams is sufficient to convey the sulfur to a desired location on a storage pad. The invention is useful in conveying molten sulfur from tanks of a truck or tankcar to a storage site for further delivery to consumers.

3,637,352

PROCESS OF PURIFYING SULFUR-CONTAINING EXHAUST GASES AND OF RECOVERING SULFUR

Karl Bratzler, Bad Homburg v.d.H.; Wilhelm Herbert, Frankfurt/Main; Reinhard Hoehne, Neu Isenburg, and Klaus Storp, Frankfurt/Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt/Main, Germany

Filed Feb. 3, 1969, Ser. No. 807,160
Claims priority, application Germany, Feb. 2, 1968, P 16 67 636.1
Int. Cl. C01b *17/04*
U.S. Cl. 23—225 P **15 Claims**

A process of purifying gas which contains hydrogen sulfide and sulfur dioxide, and simultaneously recovering sulfur, comprising contacting said gas with activated carbon at an

elevated temperature for adsorption of sulfur by the activated carbon and subsequently regenerating the activated carbon, characterized in that the hydrogen sulfide to sulfur dioxide ratio in the gas is 2.5:1 to 4.0:1, the gas is treated in two successive stages each of which contains activated carbon, the first stage being operated at a temperature of 120°–200πζ c. and causing hydrogen sulfide and sulfur dioxide to react according to the reaction equation $2H_2S+SO_2$ $2H_2O+3S$, oxygen is added to the gas which has been treated in the first stage, said gas is subsequently passed at temperatures below 200° C. through the second stage containing activated carbon for reaction according to the equation $2H_2S+O$ $2H_2O+2S$.

3,637,353

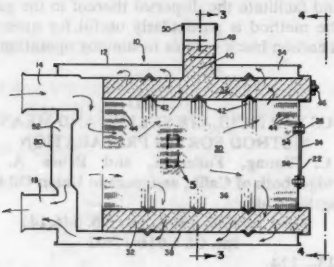
APPARATUS FOR PURIFYING AND SILENCING THE EXHAUST GASES OF A HYDROCARBON-FUELED ENGINE

Harold R. Smithson, Westtown, and Kenneth P. Strohl, Media, both of Pa., assignors to Oxy-Catalyst, Incorporated, West Chester, Pa.

Continuation-in-part of application Ser. No. 7,821, Feb. 2, 1970, now abandoned. This application Aug. 24, 1970, Ser. No. 66,233

Int. Cl. B01j *9/04*

U.S. Cl. 23—288 F **9 Claims**



An apparatus for purifying and silencing the exhaust gases generated by a hydrocarbon fuel and more especially a gasoline or diesel-fueled engine. The apparatus has an outer shell having inlet and outlet ports and an access means for servicing the apparatus. Inside the shell there are three coaxially aligned chambers through which the exhaust gases flow in series from the inlet port to the outlet port. The central chamber is packed with a heavy metal catalyst, for example, a platinum-plated catalyst for purifying the exhaust gases. The apparatus is especially useful on automobiles, buses and trucks which are operated in congested center city areas.

3,637,354

TRIM MEMBERS

Donald R. Zaremski, Cheswick, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1969, Ser. No. 860,541

Int. Cl. B32b *15/04*; B60r *13/04*

U.S. Cl. 29—191.6 **12 Claims**

The application describes assemblies comprised of a body member in combination with a stainless steel trim member having a contact surface which abuts the body member and an exposure surface subject to view. Adhered to the contact surface and located between the contact surface and the body member is a layer of aluminum which provides galvanic protection for the body member. Covering the aluminum is a chromate or phosphate conversion coating which provides protection against aluminum galvanic corrosion without detrimentally affecting the galvanic protection which aluminum provides for the body member. Also described are conversion-coated, aluminum-striped stainless steel composites suitable for fabrication into trim members and a method for producing conversion-coated, aluminum-striped stainless steel trim members.

3,637,355

ARTIFICIAL FIREPLACE LOGS WHICH BURN WITH COLORED FLAME

William Hughes Brockbank, 777 East South Temple, Salt Lake City, Utah

Filed June 20, 1969, Ser. No. 835,092

Int. Cl. C10l *11/00*

U.S. Cl. 44—1 R **6 Claims**

An artificial fireplace log containing pyrogenic coloring matter which produces colored flames upon ignition of the log continuously until the log is consumed. The log is composed of combustible materials, preferably sawdust and wax, and contains pyrogenic coloring matter distributed throughout the log mix. Additional pyrogenic coloring matter is adhered to the surface of the log, preferably along two adjacent longitudinal sides corresponding to the top and front of the log as it is positioned in a fireplace. The preferred pyrogenic coloring matter comprises chlorinated vinyl polymers or copolymers either alone or in mixture with other metallic salts known to provide flame coloration upon burning. These flame colorants can be used in any form and with virtually any combustible materials in fireplaces. The process of the invention includes the steps of preparing an artificial log mix containing pyrogenic coloring matter, molding an artificial log with the mix, and adhering pyrogenic coloring matter, preferably in the form of dry, finely divided particles, along the surface of the log.

3,637,356

DIESEL FUEL COMPOSITION

Andre Jacques Emile Vanderlinden, Watermael-Boitsford, and Gilbert Jules Ghislain Stubbe, Liege, both of Belgium, assignors to Cosden Oil & Chemical Company, Big Springs, Tex.

Filed July 15, 1965, Ser. No. 472,365

Claims priority, application Italy, Mar. 31, 1965, 28472

Int. Cl. C10l *1/18, 1/24, 1/32*

U.S. Cl. 44—51 **14 Claims**

A diesel fuel containing a carbonated, basic barium salt to reduce smoke.

3,637,357

FUEL EMULSION WITH IMPROVED STABILITY

James Nixon, Westfield, and Fredrick L. Jonach, Short Hills, both of N.J., assignors to Esso Research and Engineering Company

Filed July 23, 1969, Ser. No. 844,195

Int. Cl. C10l *1/32*

U.S. Cl. 44—51 **11 Claims**

Stability of viscous liquid hydrocarbon emulsions, wherein the hydrocarbon is present in a major proportion as the dispersed phase and emulsifiers do not represent more than 2 wt. percent of the total emulsion, is improved by the addition of certain dicarboxylic acid derivatives derived from reaction with amines and alcohols.

3,637,358

STABILIZATION OF HYDROCARBON OILS

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 543,008, Apr. 18, 1966, now Patent No. 3,478,096, dated Nov. 11, 1969. This application Mar. 5, 1969, Ser. No. 804,712

Int. Cl. C10l *1/22*

U.S. Cl. 44—72 16 Claims

Stabilizing hydrocarbon oil with an N-substituted alkoxyalkylamine. The invention is particularly advantageous to prevent sediment formation in fuel oil.

3,637,359

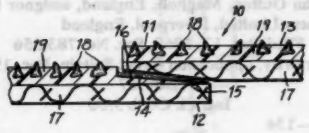
COATED ABRASIVE BELT OVERLAP JOINT

John F. Malloy, Waterford, and Charles J. Seiler, Elnora, both of N.Y., assignors to Norton Company, Troy, N.Y.

Continuation-in-part of application Ser. No. 514,360, Dec. 16, 1965, now abandoned. This application Jan. 6, 1970, Ser. No. 916

Int. Cl. B24d *11/00*

U.S. Cl. 51—298 5 Claims



An adhesive composition is provided for the manufacture of coated abrasive belts which has the advantageous characteristics of a relatively long permissible dwell time, shelf and/or pot life, and which provides on curing, after application as a coating, good adhesion. The cured product of the adhesive composition comprises in admixture the reaction product of a hydroxyl terminated polyurethane-polyester and a component having available free isocyanate groups, and a suitable tackifying agent.

3,637,360

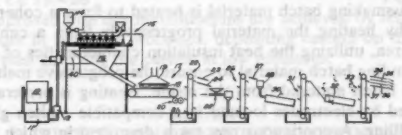
PROCESS FOR MAKING CUBICAL SINTERED ALUMINOUS ABRASIVE GRAINS

Herbert F. G. Ueltz, Youngstown, N.J., and Alfred G. Rzucidlo, Niagara Falls, N.Y., assignors to U.S. Industries, Inc.

Filed Aug. 26, 1969, Ser. No. 853,184

Int. Cl. B24d *3/02*; C09c *1/68*

U.S. Cl. 51—309 12 Claims



Process for making an aluminous abrasive grain formed from bauxite, or mixtures of bauxite and Bayer Process alumina, wherein the comminuted aluminous material is mixed with water and ferric ammonium citrate and reduced to a state of fine subdivision by milling to give a fluid slurry of high solid content, placing said slurry in an electrophoretic cell having one or more electrically conducting rotating anodes, and one or more electrically conducting stationary cathodes. The slurry is maintained at a predetermined level so that the rotating anodes are partially immersed. The anodes are connected to a source of positive direct current and the circuit completed by connection of the cathodes to the same source of direct current but to the negative terminal thereof. The solid aluminous material migrates to the anodes where it adheres as a layer which is continuously removed from the slurry by rotation of the anodes, is partially dried by impingement of warm air whereupon the layer releases from the surface of the anodes in the form of platelike pieces which are blown free of the cell by the warm airstream. The layer is controlled to a thickness equal in one dimension of the final grain compensated for subsequent shrinkage. The platelike pieces resulting are further dried, broken to approximately cubical grains, screened, optionally rounded by air mulling, screened, sintered and screened to give the final product.

3,637,361

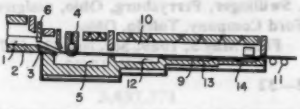
PROCESS FOR THE MANUFACTURE AND SIZING OF FLOAT GLASS

Hideo Kita, Amagasaki-shi, and Kunihiko Ito, Nishinomiya-shi, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation of application Ser. No. 479,548, Aug. 13, 1965, now abandoned. This application Dec. 12, 1968, Ser. No. 785,048. The portion of the term of this patent subsequent to May 6, 1986, has been disclaimed.

Int. Cl. C03b *39/00*

U.S. Cl. 65—25 5 Claims



A process for the manufacture of sheet glass which involves flowing a controlled amount of molten glass down an inclined plane onto and along the upper surface of a bath of molten metal. The molten glass is sized by passing it beneath a sizing member which extends widthwise of the bath and which has at least the portion thereof facing the molten glass layer passing thereunder composed of a porous and permeable material. Producer gas or hydrocarbon gas is introduced into the sizing member and is blown out through the porous and permeable portion thereof to form and maintain a burning gaseous film between the surface of the sizing member and the molten glass layer.

3,637,362

METHOD AND APPARATUS FOR HEAT-TREATING GLASS SHEETS

Waldemar W. Oelke, Rossford; Thomas B. O'Connell, Toledo, and Richard A. Herrington, Millbury, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

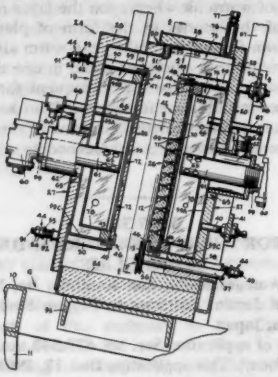
Filed Sept. 16, 1968, Ser. No. 759,976

Int. Cl. C03b *25/00*

U.S. Cl. 65—25 A 10 Claims

This application discloses a method and apparatus for heating glass sheets to an elevated temperature while they are supported, preferably in a substantially vertical plane, with one surface against a cushion of air and moved in a generally continuous manner through a substantially enclosed tunnel. The apparatus includes apertured panels located within the tunnel at either side of the path of travel of the glass, and through which panels heating and support-

ing gases are directed toward the glass surfaces; aspirating means for recovering and recirculating the gases; and special

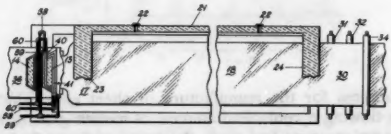


designs and patterns of apertures for the panels, at least one of which has improved heat reflecting characteristics.

3,637,363
ATMOSPHERE TWEEL SEAL METHOD AND APPARATUS

Francis L. Swillinger, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed May 5, 1969, Ser. No. 821,607
Int. Cl. C03b *18/02*
U.S. Cl. 65—32 **8 Claims**



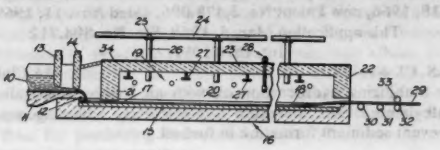
Sealing the tweel relative to the opening through which it passes in the canal cover of an apparatus for producing float glass. A double-sectioned chamber surrounds the tweel whereby the outer section of the chamber serves as a liquid cooled support, and a gas is supplied to the inner section under pressure. The inner section has a porous wall facing the tweel through which the gas is forced to form a gaseous cushion or film preventing frictional contact between the porous wall and the tweel and minimizing the intrusion of atmospheric oxygen into the canal through the seal.

3,637,364
BATH TEMPERATURE CONTROL IN FLOAT GLASS APPARATUS

Eldwin C. Montgomery, Modesto, Calif., assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Nov. 21, 1969, Ser. No. 878,751
Int. Cl. C03b *18/02*
U.S. Cl. 65—65 A **8 Claims**

Stabilizing the dimensions of the equilibrium ribbon formed by controlling the temperature of the glass layer in the tank of a float glass apparatus. The power input to electric heating elements within the tank is modulated in response to direct measurement of the temperature of the glass layer. The radiant energy emitted by the surface of the glass layer is directly sensed and transformed into an electrical signal corresponding to the temperature of the surface. This signal is compared by suitable control means with that

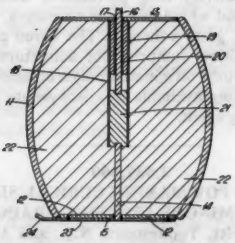


of a predetermined set point, and differences therebetween initiate a response from electrical control means to correct deviations by appropriately increasing or decreasing the power input to the heating elements.

3,637,365
PREHEATING GLASS BATCH MATERIAL BY MELTING THE BATCH CORE AREA

Richard John Oulton, Maghull, England, assignor to Pilkington Brothers Limited, Liverpool, England

Filed Dec. 12, 1968, Ser. No. 783,356
Claims priority, application Great Britain, Dec. 19, 1967, 57,500/67
Int. Cl. C03b *3/00*
U.S. Cl. 65—134 **23 Claims**



Glassmaking batch material is heated to form a coherent body by heating the material progressively from a central core area, utilizing the heat insulation characteristics of the surrounding batch material to ensure the progressive melting of the batch material from the inside. Heating is preferably effected by electrodes located in a compatible molten glass core filling. A continuous process is described in which the batch material is advanced along a conveyor during treatment before passing into a glass furnace tank.

3,637,366
METHOD AND COMPOSITION THEREFOR

Ronald E. Wietelmann, and Lawrence S. Wittenbrook, both of Marysville, Ohio, assignors to The O.M. Scott and Sons Co., Marysville, Ohio

Continuation of application Ser. No. 239,794, Nov. 23, 1962, now abandoned. This application Sept. 4, 1969, Ser. No. 855,381
Int. Cl. A01n *9/22*
U.S. Cl. 71—92 **9 Claims**

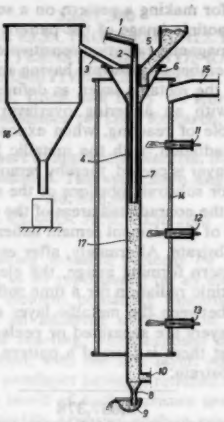
The herbicidal use of aminobenzenesulfonamides.

3,637,367

PROCESS AND DEVICE FOR THE DISTILLATIVE PURIFICATION OF METALS, ESPECIALLY OF ZINC

Norbert Lowicki, Duisburg-Hamborn, Germany, assignor to Grillo Werke Aktiengesellschaft, Duisburg-Hamborn, Germany

Filed July 19, 1968, Ser. No. 746,191
Claims priority, application Germany, July 20, 1967, P 15 83 880.9
Int. Cl. C22b *9/02, 19/14;* B01d *3/28*
U.S. Cl. 75—63 22 Claims



Metal, especially zinc, is purified by distillation of the metal in the fused state in a packed column. The fused metal is introduced at the top of the packing so that a coherent stream of the metal flows through a considerable height of the packing. Heat is supplied to the packing to provide a temperature gradient across the packing so that the temperature of the vapor remote from the coherent stream is relatively high with respect to the temperature of the coherent stream.

3,637,368

INCREASED METALLIZATIONS OF IRON ORE FROM FLUIDIZED BED PROCESSES

Glyndwr A. R. Bessant, Baytown, Tex., assignor to Esso Research and Engineering Company

Filed Oct. 16, 1968, Ser. No. 768,162
Int. Cl. C22b *1/02;* C21b *13/14*
U.S. Cl. 75—26 7 Claims

Improved iron ore metallizations are achieved by reducing the ore in fluidized processes, depositing carbon on the ore and then gasifying the carbon at low pressures.

3,637,369

FLUIDIZED IRON ORE REDUCTION PROCESS

Roger F. Sebenik; Martin O. Gernand, and Marnell A. Segura, all of Baton Rouge, La., assignors to Esso Research and Engineering Company

Filed Jan. 7, 1969, Ser. No. 789,589
Int. Cl. C22b *1/02;* C21b *13/14*
U.S. Cl. 75—26 9 Claims

An improved process for the production of metallic iron by direct reduction of iron ores at relatively high temperatures. The ore is staged in a series of beds, fluidized by contact with ascending gas, and reduced. In ferric reduction zones, ferric oxide (hematite) is reduced to magnetic oxide of iron (magnetite), and the latter is thence reduced to substantially ferrous oxide (wustite). In the ferrous reduction zone, or zones, the ferrous oxide is reduced to metallic iron. By addition or incorporation with the partially reduced ore of a ferrous reduction zone, or zones, of critical amounts of salts formed from Groups I-A, II-A and III-A metals, and metalloids, particularly halide salts and nonoxide-forming hydroxides and carbonates of such metals, the overall rate of reduction of the ore is promoted and metallization increased without significant adverse effects due to bogging. The process has special utility with regard to the reduction of specular hematite ores, particularly with carbon monoxide and carbon monoxide-containing gases.

3,637,370

PRODUCTION OF FERROVANADIUM ALLOYS

Donald O. Buker, New Concord, Ohio, assignor to Foote Mineral Company, Exton, Pa.

Filed June 10, 1968, Ser. No. 735,590
Int. Cl. C22c *1/00;* C22b *55/00*
U.S. Cl. 75—40 5 Claims

A method of producing a low-carbon low-oxygen ferrovanadium alloy by carbon reduction in which an agglomerated mixture of comminuted vanadium oxide, preferably a pentoxide, an iron-source material, and a carbon-source material are heated in vacuum to a temperature of 2,400°–2,800° F. The temperature is maintained until evolution of gas substantially ceases and the product fuses. Additional agglomerate can be charged into the vacuum environment without breaking the vacuum, and molten alloy continuously collected to provide a substantially continuous process.

3,637,371

DIRECT PRESSURE LEACHING OF COPPER-IRON SULPHIDES

Vladimir Nicolaus Mackiw, Fort Saskatchewan, Alberta; Herbert Veltman, Edmonton, Alberta, and Andrew Imre Vizsolyi, Vancouver, British Columbia, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed June 19, 1967, Ser. No. 647,201
Claims priority, application Canada, Feb. 10, 1967, 982,536
Int. Cl. C22b *15/08*
U.S. Cl. 75—101 9 Claims

Complex copper-iron bearing sulphides, particularly chalcopyrite, ground to at least 90 percent minus 325 mesh standard Tyler screen are leached in aqueous sulphuric acid solution containing less acid than that required to combine with the copper content of the sulphides as copper sulphate. Leaching is continued at a temperature within the range of 210° F. to 250° F. under an oxygen partial pressure above 100 p.s.i. until all the acid is consumed and the iron content of the solution is lowered to an acceptable level.

3,637,372

METHOD FOR RECOVERING NICKEL

Yoland P. P. Mayor, 1299 Commugny, Switzerland, and Pierre F. Tord, 18, rue Visconti, Paris, France

Filed Nov. 6, 1969, Ser. No. 874,725
Claims priority, application France, Nov. 8, 1968, 173235
Int. Cl. C22b *23/04, 15/08*
U.S. Cl. 75—101 3 Claims

The method provides the recovery of at least nickel from ores or other materials containing it possibly with copper, by treating the ores with a cupric chloride solution and an alkaline or alkaline earth chloride, and then separating the nickel from the said solution by cementing with iron.

3,637,373

COMPOSITIONS FOR THE TREATMENT OF MOLTEN IRON

Karl Gusten Bylund, and Evert Henry Bark, both of Hallefors-nas, Sweden, assignors to AB Jarnforadling, Hallefors-nas, Sweden

Continuation of Ser. No. 734,518, June 5, 1968, abandoned
Filed Mar. 2, 1970, Ser. No. 14,799
Claims priority, application Sweden, June 8, 1967, 8044/67
Int. Cl. C22c *37/04*
U.S. Cl. 75—130 A 3 Claims

A composition for the treatment of molten iron consists of a mechanical mixture, compacted into solid porous bodies, of magnesium which serves as a treatment agent, and sponge iron as a reaction retarding agent.

3,637,374

METHOD OF PRODUCING TUNGSTEN RHENIUM ALLOYS BY CHEMICAL VAPOR DEPOSITION

Robert A. Holzl, La Canada; Frederick A. Glaski, Chatsworth, and James R. Humphrey, North Hollywood, all of Calif., assignors to Fansteel Metallurgical Corporation, North Chicago, Ill.

Filed May 27, 1968, Ser. No. 732,308
Int. Cl. C22c *27/00*; B22d *23/00*
U.S. Cl. 75—174 6 Claims

In a chemical vapor deposition process wherein a plurality of refractory metals is deposited on the surface of a substrate, the usual columnar grain structure of the deposited metals inherent in chemical vapor deposited coatings is rearranged to form an alloy of such metals having a strong, equiaxed grain structure, by depositing the metals in extremely thin layers wherein all adjacent layers are predominately of different metals, and then heattreating the resultant coating. As a result, diffusion of the metals through substantially all adjacent layers, and rearrangement of the grain structure occurs.

3,637,375

PHOTOPOLYMERIZATION UTILIZING DIAZOSULFONATES AND PHOTOREDUCIBLE DYES

Steven Levinos, 25 Hickory Pl., Chatham, N.J.

Filed May 25, 1970, Ser. No. 40,439
Int. Cl. G03c *1/70*
U.S. Cl. 96—28 10 Claims

Polymerization of ethylenically unsaturated vinyl compounds is effected by exposing such compounds to light in the presence of a photoinitiator comprising a combination of a light-sensitive diazosulfonate and a photoreducible dye. The further addition of amines and aldehyde/bisulfite addition products accelerates the polymerization reaction.

3,637,376

SILVER SALT DIFFUSIONS COPYIMG METHOD

Rudolf Wendt, Harkesheide, near Hamburg, Germany, assignor to Lumoprint Zindler KG, Hamburg, Germany

Filed Feb. 5, 1968, Ser. No. 703,026
Claims priority, application Germany, Feb. 10, 1967, L 55706
Int. Cl. G03c *5/54*
U.S. Cl. 96—29 5 Claims

Silver salt diffusion transfer method, wherein an image is formed by exposure on the silver halide emulsion layer of a negative sheet and the thus exposed negative sheet is developed by a developer liquid, whereupon the developed image is transferred by pressure contact to a receiving sheet. The invention provides that the receiving sheet is uncoated sheet material which, prior to the pressure contact with the negative material, is moistened with a liquid of different composition than said developer liquid, the liquid comprising an aqueous alkaline or acidic solution containing a substance exhibiting amphoteric properties and being capable of reducing silver salts to silver.

3,637,377

METHOD FOR MAKING A PATTERN ON A SUPPORT MEMBER BY MEANS OF ACTINIC RADIATION SENSITIVE ELEMENT

Robert W. Hallman, Utica, and Gary W. Kurtz, Southfield, both of Mich., assignors to Teeg Research, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 627,813, Apr. 3, 1967, and a continuation-in-part of 662,214, Aug. 21, 1967. This application July 15, 1969, Ser. No. 841,718
Int. Cl. G03c *5/00*, *5/04*
U.S. Cl. 96—35 16 Claims

A method for making a pattern on a support member by projecting an actinic image of the pattern to be reproduced on an electromagnetic-radiation-sensitive element consisting of a support member or substrate having an adhering metallic layer thereon, the metallic layer, as defined herein, being in turn coated with an adhering overlayer of an inorganic material capable of reacting, when exposed to electromagnetic actinic radiation, with the metallic layer. After exposure, the overlayer is peeled, thereby removing from the support member or substrate portions of the metallic layer corresponding to the nonradiated areas of the element, while the radiated areas of the element remain adhering to the support member or substrate. Alternately, after exposure of the element to a pattern forming image, the element is uniformly exposed to actinic radiation for a time sufficient to decrease the adhesion between the metallic layer and the overlayer, and the two layers are separated or peeled away from each other such that there is formed a pattern upon the support member or substrate.

3,637,378

RADIATION-SENSITIVE ELEMENT, PROVIDED WITH FLEXIBLE BASE AND METHODS FOR EXPOSING AND PROCESSING THE SAME

Robert W. Hallman, Utica, and Gary W. Kurtz, Southfield, both of Mich., assignors to Teeg Research, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 642,972, June 1, 1967, which is a continuation-in-part of application Ser. No. 591,711, Nov. 3, 1966, now abandoned, Ser. No. 841,416, July 14, 1969, which is a continuation-in-part of Ser. No. 627,754, Apr. 3, 1967, abandoned, Ser. No. 841,718, July 15 1969, which is a continuation-in-part of Ser. No. 627,813, Apr. 3, 1967. This application Oct. 20, 1969, Ser. No. 867,575
Int. Cl. G03c *5/04*, *5/00*
U.S. Cl. 96—35 7 Claims

Radiation-sensitive elements comprising a substantially thin metallic layer coating a flexible sheet material such as paper, cardboard, plastic, and the like, and provided with an overlayer disposed on the metallic layer made of an inorganic material capable of interreacting with the metal or metals of the metallic layer when exposed to electromagnetic actinic radiation. The overlayer may be in a solid phase or a vapor phase. After exposure to electromagnetic actinic radiation, the element is processed by removing the product resulting from the interaction between the metallic layer and the inorganic material of the overlayer, removing the overlayer for some applications, and darkening or dying the metallic image thus obtained on the flexible backing.

3,637,379

METHOD FOR MAKING A RELIEF PATTERN BY MEANS OF ELECTROMAGNETIC RADIATION AND HEAT-SENSITIVE ELEMENTS

Robert W. Hallman, Utica, and Gary W. Kurtz, Southfield, both of Mich., assignors to Teeg Research, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 647,525, June 20, 1967, now abandoned. This application July 30, 1969, Ser. No. 846,212
Int. Cl. G03c *5/00*, *1/72*
U.S. Cl. 96—36 10 Claims

Methods for making a metallic relief pattern article by irradiating, according to the pattern to be reproduced, a radia-

tion and heat sensitive element comprising essentially a layer of metal coated with an adhering overlayer of an inorganic material capable of interreacting with the metal when either exposed to electromagnetic radiation or exposed to heat. After exposure to electromagnetic radiation which causes a reduction in adhesion between the overlayer and the layer of metal, the element is stripped of the portions of the overlayer corresponding to the irradiated areas and is subsequently heated for causing an interreaction between the remaining portions of the overlayer and the layer of metal, consuming in depth and thus etching the metal of the layer of metal.

3,637,380

METHODS FOR ELECTROCHEMICALLY MAKING METALLIC PATTERNS BY MEANS OF RADIATION-SENSITIVE ELEMENTS

Robert W. Hallman, Utica, and Gary W. Kurtz, Southfield, both of Mich., assignors to Teeg Research, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 648,713, June 26, 1967, now abandoned. This application Aug. 8, 1969, Ser. No. 848,676

Int. Cl. G03c *5/00;* **C23b** *5/48*

U.S. Cl. 96—35 **10 Claims**

Methods for making metallic patterns by projecting an image of a pattern to be reproduced on an electromagnetic radiation-sensitive element consisting essentially of a first layer coated with an adhering overlayer of an inorganic material capable of reacting, when exposed to electromagnetic actinic radiation, with the first layer. After exposure, the portions of the overlayer having a reduced adhesion with the first layer as a result of such exposure are peeled, thus selectively and discretely exposing surface areas of the first layer which are subsequently electroplated or electrochemically eroded or etched according to whether a relief or a recessed pattern is desired.

Radiation-sensitive elements having a first layer thin enough to be transmissive of the radiation may be exposed by projection of the image of the pattern upon the first layer, thus consuming in depth selective and discrete portions of the first layer. The remaining unreacted portions of the first layer are subsequently electroplated.

3,637,381

RADIATION-SENSITIVE SELF-REVEALING ELEMENTS AND METHODS OF MAKING AND UTILIZING THE SAME

Robert W. Hallman, Utica, and Gary W. Kurtz, Southfield, both of Mich., assignors to Teeg Research, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 591,711, Nov. 3, 1966, now abandoned. This application July 3, 1969, Ser. No. 839,038

Int. Cl. G03c *5/00, 1/72*

U.S. Cl. 96—35 **36 Claims**

Electromagnetic radiation-sensitive elements made essentially of a metallic layer and of an overlayer of an inorganic material capable of interreacting with the metal of the metallic layer, when exposed to electromagnetic actinic radiation, so as to cause a selective etching of the metallic layer surface at the boundary between the metallic layer and the overlayer which is proportional in depth to the amount of exposure to the electromagnetic actinic radiation. The overlayer may be in a solid form as a thin coating adhering to the metallic layer, or it may be in a liquid or a vapor form. Electromagnetic radiation sensitive elements, consisting of a plurality of strata, each made of a pair of layers of dissimilar materials, one of which is metallic and the other is a layer of actinically reactive inorganic material are provided for particular applications. Exposure to actinic electromagnetic radiation of the elements of the invention causes physical and chemical changes in the materials of the two layers resulting in selective removal, after exposure, of some of the materials of predetermined layers for obtaining particular finished articles.

3,637,382

PLATES, SHEETING AND FILM OF PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING INDIGOID DYES

Carl Heinrich Krauch, Heidelberg, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen(Rhine), Germany

Filed Sept. 20, 1968, Ser. No. 761,343

Claims priority, application Germany, Sept. 22, 1967, P 16 69 723.7

Int. Cl. G03c *1/68*

U.S. Cl. 96—35.1 **12 Claims**

Improved solid or semisolid photopolymerizable layers for use in producing relief printing plates, said layers including a photopolymerizable compound having at least two polymerizable olefinic double bonds, a photoinitiator, and an indigoid dye, and a process for determining the light sensitivity of said layer by using said indigoid dye as a color indicator whereby the amount of exposure required to photopolymerize the layer by irradiation is accurately determined.

3,637,383

RADIATION-SENSITIVE ELEMENTS AND ETCH PROCESSES USING THE SAME

Robert W. Hallman, Utica, and Gary W. Kurtz, Southfield, both of Mich., assignors to Teeg Research, Inc., Detroit, Mich.

Continuation-in-part of application Ser. No. 627,754, Apr. 3, 1967, now abandoned , Continuation-in-part of application Ser. No. 636,863, May 8, 1967, now abandoned. This application July 14, 1969, Ser. No. 841,416

Int. Cl. G03c *1/76, 5/00*

U.S. Cl. 96—36 **24 Claims**

Radiation-sensitive elements comprising a pair of layers of dissimilar inorganic materials capable of interreacting when subjected to impinging electromagnetic actinic radiation with the formation of an interreaction product or products corresponding to the areas exposed to such radiation, and further comprising at least one underlying layer of a third material which is sought to be discretely and selectively etched according to a pattern or image projected upon the sensitive element. The portions of the radiation-sensitive element which have not been exposed to actinic radiation act as a resist material during etching of underlying layers, such that a relief representation of the original image projected upon the sensitive element is obtained by a simple process consisting principally of exposure to actinic radiation followed by a one-step or two-step etch operation.

3,637,384

POSITIVE-WORKING DIAZO-OXIDE TERPOLYMER PHOTORESISTS

Albert S. Deutsch, New York, and Frank J. Loprest, Vestal, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Feb. 17, 1969, Ser. No. 799,998

Int. Cl. G03f *7/08*

U.S. Cl. 96—36 **5 Claims**

A novel positive-working photoresist composition comprising a diazo-oxide such as N-dehydroabietyl-6-diazo-5(6H)-oxo-1-naphthalene-sulfonamide, a resin such as a terpolymer which contains carboxy groups, and a solvent therefor.

3,637,385

SOLID DEFORMATION IMAGING

Lester P. Hayes, Decatur, Ill.; Rexford W. Jones, and William B. Thompson, both of Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Feb. 5, 1969, Ser. No. 796,847
Int. Cl. G03c 5/24, 1/68
U.S. Cl. 96—48 47 Claims

Process and articles for forming line, halftone or continuous-tone images which comprises: exposing to actinic radiation in image-receiving manner a solid, positive-acting or negative-acting light-sensitive organic layer having a thickness of at least 0.1 micron, said layer being capable of developing a R_d of 0.2 to 2.2; continuing the exposure to either clear the background of positive-acting light-sensitive layers or to establish a potential R_d of 0.2 to 2.2 with negative-acting light-sensitive organic layers; applying to said layer of organic material, free-flowing powder particles having a diameter, along at least one axis of at least about 0.3 micron but less than 25 times the thickness of said organic layer; while the layer is at a temperature below the melting points of the powder and of the organic layer, physically embedding said powder particles as a monolayer in a stratum at the surface of said light-sensitive layer to yield images having portions varying in density in proportion to the light exposure of each portion; and removing nonembedded particles from said organic layer to develop an image.

3,637,386

METALLIZING SOLUTION FOR INTENSIFYING LAYERS OF METALLIC, IMAGED NUCLEI

Willem Gerbrecht De Ruig, Tromplaan; Arian Molenaar, and Hendrik Jonker, both of Emmasingel, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1967, Ser. No. 635,409
Int. Cl. G03c 5/32
U.S. Cl. 96—60 4 Claims

Form metal layer of a metal such as copper, tin, nickel or cobalt on an electrically nonconducting layer by first forming a silver or mercury nuclei image on the layer and then treating the layer with an aqueous solution of the metal to be deposited and a mixture of reducing metal ions and the oxidated forms thereof. An example is an aqueous solution of nickel ions and mixture of $Cr^{2+}$and Cr^{3+}. This abstract is not intended to be a description of the invention defined by the claims.

3,637,387

DIRECT POSITIVE EMULSION CONTAINING A HALIDE RELEASING COMPOUND DEVELOPED IN THE PRESENCE OF AN UNSUBSTITUTED HYDRAZINE

Gerard L. Vanreusel, Hove, and Camille A. Vandeputte, Mortsel, both of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Oct. 24, 1967, Ser. No. 677,765
Int. Cl. G03c 5/24
U.S. Cl. 96—64 24 Claims

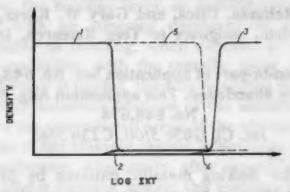
Direct positive copies obtained by imagewise exposing a light-sensitive material having a layer of a silver halide emulsion of the type that forms a latent image predominantly within the silver halide grains in which emulsion is incorporated at least one compound setting free iodide ions or at least one compound setting free bromide ions in an aqueous medium together with a fog inhibiting compound and developing thus exposed material with an energetic surface developer in the presence of an unsubstituted hydrazine or a water soluble salt thereof provided by way of the developer solution or by way of a processing liquid applied to the exposed material prior to development. Colored images can be formed as well as black and white images provided color coupling agents and color developing agents are utilized.

3,637,388

PROCESS FOR THE PHOTOGRAPHIC PRODUCTION OF EQUIDENSITIES

Erwin Ranz; Harald Von Rintelen; Raymund Pfeiffenschneider, all of Leverkusen, and Armin Voight, Cologne-Stammheim, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 9, 1968, Ser. No. 766,155
Claims priority, application Germany, Dec. 18, 1967, P 15 97 509.4
Int. Cl. G03c 5/30, 1/02, 5/38
U.S. Cl. 96—66 6 Claims



The production of areas of equal density in a photographic image by combining in a photographic material two silver halide emulsions in one or two layers, one of which emulsions is more soluble in photographic developer than the other emulsion but the more soluble emulsion is lower in speed than the less soluble emulsion and the less soluble emulsion is present in a much smaller proportion. After the photographic material is exposed it is developed in a bath having a silver halide developing compound and a silver halide solvent for the slower halide emulsion so that the faster less soluble emulsion is developed in the exposed area to yield a negative silver image and the slower silver halide emulsion is physically developed to yield a positive image and chemically developed to yield a negative image. The developed material is finally fixed.

3,637,389

METHOD OF PRODUCING PHOTOGRAPHIC IMAGES BY RAPID PROCESSING

Emiel Alexander Hofman, Mortsel, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Apr. 7, 1969, Ser. No. 814,165
Int. Cl. G03c 5/30, 1/78, 1/06
U.S. Cl. 96—66 12 Claims

Significant improvement in gradation, relative speed, and maximum density is obtained in a method of rapidly photographically developing an imagewise exposed light-sensitive photographic material comprising a hydrophobic film support and a rapidly developable silver halide emulsion layer wherein the silver halide consists of at least about 90 percent silver chloride, is developed with an aqueous processing solution in the presence of a photographic developing agent for a time of less than 15 seconds, provided at least one water permeable layer formed essentially of a hydrophilic colloid is interposed between the film support and the emulsion layer and in direct contact with the emulsion layer, the total weight of such water permeable layers being at least about 2 grams per square meter up to about 8 gm/sq. m. Preferably the colloid is proteinaceous and preferably the developed photographic material is passed in succession through stabilizing, fixing, and rinsing baths, remaining in contact with each less than about 15 seconds. An optimum time of contact for each processing step is about 2–8 seconds.

3,637,390
PHOTOGRAPHIC MEDIUM CONTAINING AN ALIPHATIC AMINE STABILIZER

John O. H. Peterson, Cape Elizabeth, Maine, assignor to Scott Paper Company, Delaware County, Pa.

Filed Dec. 19, 1969, Ser. No. 886,738
Int. Cl. G03c 1/72
U.S. Cl. 96—90 7 Claims

In a photographic medium containing a furfurylidene, an aromatic amine enhancer system and a lower haloalkane sensitizer, the improvement comprising adding an aliphatic amine to the aromatic amine enhancer system.

3,637,391
PROCESS FOR THE PREPARATION OF SILVER HALIDE EMULSIONS

Wilhelm Saleck, Gladbach-Schildgen; Wolfgang Himmelmann, Opladen-Luetzenkirchen; Rudolf Meyer, Leverkusen; Franz Moll, and Harald Huckstadt, both of Cologne, Stammheim, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 2, 1969, Ser. No. 854,792
Claims priority, application Germany, Sept. 5, 1968, P 17 97 254.2
Int. Cl. G03c 1/02
U.S. Cl. 96—94 9 Claims

The photographic properties such as sensitivity and graininess of silver halide emulsions can be improved by performing the precipitation of silver halide and/or the afterripening in presence of silicic acid sols instead of or in admixture to gelatin as protective colloid. The agglomeration of silicic acid particles which often occurs at high concentrations of salts can be avoided by addition of ethanol or of water-soluble polymers or by the preparation of such polymers in the silicic acid sol.

3,637,392
DIRECT-POSITIVE SILVER HALIDE EMULSIONS CONTAINING BORON HYDRIDES

John Howard Bigelow, Rochester, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 8,417, Feb. 3, 1970. This application Aug. 10, 1970, Ser. No. 62,650
Int. Cl. G03c 1/28, 1/34
U.S. Cl. 96—108 13 Claims

Direct-positive photographic elements having good sensitometric characteristics and aging stability are prepared by incorporating in the silver halide emulsion from 5×10^{-7} to 2.4×10^{-4} mole per 1.5 moles of silver halide of at least one boron hydride in which the skeletal framework forms a polyhedron or a fragment thereof, and which may contain heteroskeletal atoms selected from the groups C, S, and N, as a chemical fogging agent.

3,637,393
LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL WITH REDUCED FOG AND NO DECREASE IN SPEED DURING DEVELOPMENT

Kenro Sakamoto; Isamu Fushiki, and Shinichi Nakamura, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed July 9, 1970, Ser. No. 53,657
Claims priority, application Japan, July 10, 1969, 44/54116
Int. Cl. G03c 1/34
U.S. Cl. 96—109 7 Claims

Fog is reduced and speed is maintained during development of light-sensitive color photographic materials which comprise at least one of certain mercaptotetrazole compounds and at least one of several hydroquinone compounds.

3,637,394
PHOTOGRAPHIC ELEMENTS CONTAINING SYNTHETIC POLYMERIC VEHICLES

Donald Arthur Smith, and Donald M. Copenhagen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 22, 1968, Ser. No. 723,279
Int. Cl. G03c 1/72
U.S. Cl. 96—114 7 Claims

Novel synthetic polymers derived from poly(vinyl alcohol) useful as hardenable gelatin replacements in compositions, photographic emulsions and elements, and a process for preparing said polymers are disclosed.

3,637,395
SILVER HALIDE EMULSIONS CONTAINING CYCLIC ENAMINE CYANINE DYES

Roy A. Jeffreys, and Elizabeth A. Gloag, both of Harrow, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 9, 1970, Ser. No. 27,179
Int. Cl. G03c 1/08, 1/10
U.S. Cl. 96—130 13 Claims

Silver halide emulsions containing optical sensitizing cyanine and merocyanine dyes which feature a cyclic enamine group containing a bridgehead nitrogen selected from a 1,2,3,5,6,7-hexahydroindolizidine nucleus or a 1H-2,3,4,6,7,8-hexahydroquinolizidine nucleus.

3,637,396
PROCESS FOR THE PRODUCTION OF FIBERLESS GREEN PLANT CONCENTRATE OF FULL BIOLOGICAL VALUE

Janos Hollo, 9, Guyon R. utca II; Istvan Zagyvai, 4, Maricz Zsigmond Korter, and Lehel Koch, 19, Erkel F. utca, all of Budapest, Hungary

Continuation-in-part of application Ser. No. 490,728, Sept. 27, 1965, now abandoned. This application July 30, 1969, Ser. No. 846,239
Claims priority, application Hungary, Sept. 28, 1964, HO-836
Int. Cl. A23k 1/14
U.S. Cl. 99—9 9 Claims

High-protein plant extract is obtained by comminuting young green plant material, pressing the material to force liquid therefrom, and coagulating and separating the true protein fraction of this liquid. The remaining liquid, which can contain toxic substances, is inoculated with a yeast capable of utilizing nitrogen sources and subjected to aerobic fermentation until the nitrogen sources are substantially exhausted and the toxicants greatly reduced. The yeast is then concentrated, either by separation or by evaporation, and combined with the coagulated true protein thereby to obtain an extract which is detoxicated.

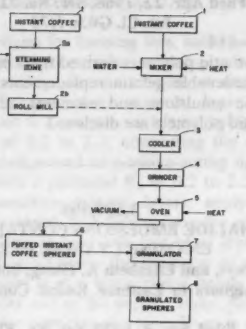
3,637,397
PUFFED INSTANT COFFEE SPHERES

James H. Menzies, Springfield Township, Hamilton County, and Joseph R. McSwiggin, Cincinnati, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed July 17, 1969, Ser. No. 842,586
Int. Cl. A23f 1/04
U.S. Cl. 99—65 12 Claims

A process for producing instant coffee in the form of distinctively appearing multidimensionally puffed spheres having very fast dissolving properties comprises forming a coffee dough, cooling the dough to form hardened slabs, grinding the slabs into discrete particles and multidimen-

sionally puffing said particles by exposing them to heat and vacuum to form puffed instant coffee spheres and subsequently granulating the spheres to produce a product resembling roast and ground coffee in appearance.



3,637,398

PREPARATION OF PARTICULATE MATTER FOR FREEZE DRYING

Byron Everett Elerath, Mountain Lakes, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed Jan. 14, 1969, Ser. No. 791,157
Int. Cl. A23f *1/08*
U.S. Cl. 99—71 **7 Claims**

A new method of preparing an extract for freeze drying has been discovered which produces particles of improved appearance in that they are more uniform and have a desirable shape and color. Preparation of frozen particles via the method of this invention is simplified and freeze drying efficiency is increased. The particles are prepared by slush freezing an extract (e.g. coffee extract) to a hard slush condition (as opposed to a soft slush condition) wherein the slush has an ice crystal content of from 20 to 60 percent by weight of the slush and the slush has a viscosity such that it can not be readily spread on a flat surface and will not tend to run or spread after extrusion, extruding the slush in a desired shape into a cold gaseous atmosphere having a temperature below the eutectic point of the extract, cutting the extruded slush and completely freezing the particles prior to freeze drying.

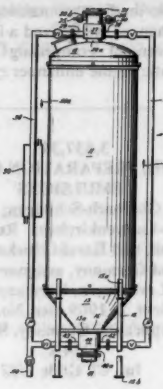
3,637,399

PROCESS FOR TREATING GRAIN

James H. Neel, 6217 Ariel, Houston, Harris County, Tex.

Filed Apr. 22, 1970, Ser. No. 30,656
Int. Cl. C13l *1/02*
U.S. Cl. 99—80 PS **2 Claims**

A steeping tank is filled with grain and then with water. The water is then circulated continuously through the steeping tank and recirculated through a heating device and pump such that the temperature in the tank is controlled. When the temperature in the tank is uniform, and has reached a desired temperature, the water pump is closed and air is then pumped into the tank until it reaches a desired pressure. Water is then circulated downwardly through the vessel so that the grain will form a suitable globule and homogenize to become a solid substance. The water in the tank is then removed which simultaneously releases the pressure in the vessel and thereafter the grain is removed.



3,637,400

HIGH-PRESSURE PROCESS FOR MAKING PUFFED FOOD PRODUCT AND PRODUCT

Joseph D. Mullen, Golden Valley; Alide Ogrins, St. Paul, and Ali R. Touba, Crystal, all of Minn., assignors to General Mills, Inc.

Filed Mar. 26, 1969, Ser. No. 810,776
Int. Cl. A23l *1/18, 1/20*
U.S. Cl. 99—83 **5 Claims**

The process for producing a puffed food product having a high-protein level from a combination of legumes and cereal grains by subjecting the raw food product to high pressures and temperatures to produce a sheet of product having relatively high-protein-content and crunchy texture.

3,637,401

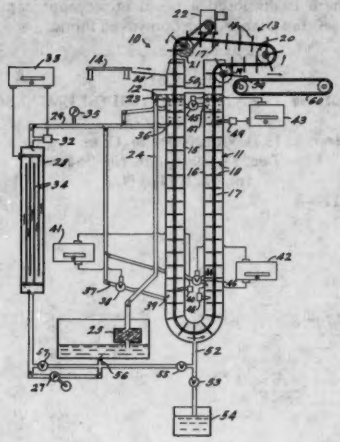
HYDROSTATIC FRYING METHOD

Walter F. Kuhlman, Norwalk, Ohio, assignor to The Roto Corporation, Norwalk, Ohio

Continuation of application Ser. No. 731,949, May 24, 1968, now abandoned. This application July 28, 1970, Ser. No. 58,821
Int. Cl. A22c *21/00, 25/00*
U.S. Cl. 99—107 **10 Claims**

A method and apparatus for continuously pressure frying food items in an open, heated, generally U-shaped column of oil having a depth such that a pressure of not less than 2.5 p.s.i.g., and preferably at least 5 p.s.i.g., exists at the lower portion of the column. The food items are placed on a conveyor which moves continuously along a path leading from the surface of the oil downwardly to the bottom of the column of oil and back upwardly to the surface. Heated oil is added at predetermined points on the U-shaped oil column to maintain distinct thermal zones or thermal gradients in the

oil column. The oil temperatures and the conveyor speed are selected such that each food item is properly cooked and



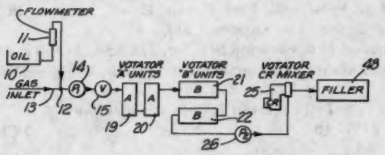
browned when it is removed from the surface of the cooking oil.

3,637,402

PROCESS OF MAKING AERATED SHORTENING

Edward J. Reid, Brea, and Perry W. Morgan, Jr., Fullerton, both of Calif., assignors to Hunt-Wesson Foods, Inc., Fullerton, Calif.

Filed Feb. 11, 1969, Ser. No. 798,327
Int. Cl. A23d 5/02
U.S. Cl. 99—118 R **11 Claims**



A process for making an aerated shortening, preferably a shortening containing about 20 to 26 percent gas by volume. A process utilizing the conventional chilling and agitating such as is obtained in Votator A and B units, in which the liquid fat and gas mixture is initially pressured to a relatively high pressure to place the gas in solution, and in which the pressure is then reduced by about half to convert at least a portion of the gas in solution to dispersed gas prior to chilling and agitation, permitting subsequent processing at lower pressure. A process in which the chilled and agitated stream is subjected to shear-type agitation with recirculation prior to packaging.

3,637,403

ENHANCEMENT OF THE FLAVOR OF FOODSTUFFS

Robert A. Heckman, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 28, 1969, Ser. No. 819,952
Int. Cl. A23l 1/22, 1/26
U.S. Cl. 99—140 R **4 Claims**

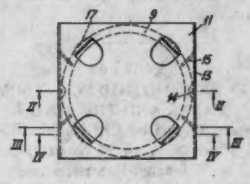
Enhancement of the flavor of foodstuffs is achieved by incorporating therewith a small amount of 1-oxa-8-oxo-2,6,10,10-tetramethyl-spiro[4,5]-6-decene.

3,637,404

CONTAINER FOR A PIE OR THE LIKE

John MacManus, 143-16-Twenty-Second Road, Whitestone, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,695
Claims priority, application Great Britain, Mar. 7, 1969, 12,265/69
Int. Cl. B65b 25/16
U.S. Cl. 99—172 **12 Claims**



The container includes an open-ended sleeve for receiving a flanged dish. Tabs are pressed out of the sleeve material to hold the dish against the bottom wall and also against longitudinal movement. A pair of elastic cords are received in diagonally opposite slots formed by pressing out material. An upright plastic peg extends from adjacent the bottom of the pie to the top wall of the sleeve to provide a spacer.

3,637,405

PROCESS FOR PACKAGING AND PRESERVING MEATS

William J. Mendelson, c/o Hillcrest Poultry Industries, P.O. Box 1707 48 Commercial St., Lewiston, Maine, and William F. Morris, Jr., Morris & Associates, Inc. P.O. Box 1406, Raleigh, N.C.

Filed May 16, 1969, Ser. No. 825,430
Int. Cl. A23b 1/00
U.S. Cl. 99—194 **9 Claims**

A process for packaging and preserving meats to give long shelf life and greater tenderness comprising: slaughtering the animal to produce a carcass, dressing, eviscerating and cleaning the carcass to form meat units, packaging at least one of the meat units prior to attaining a temperature of 40° F. and generally above 70° F. in a vaporproof package within approximately 2 hours after slaughter to prevent shrinkage of the meat due to dehydration, exposing the packaged meat unit to a chilling medium such as an airblast at below −20° F. for sufficient time to establish a negative heat content reservoir within a surface zone of a meat unit generally comprising about one-third or less of the mass of the meat unit, the negative heat content reservoir being formed by reducing the temperature of the mass of the meat unit within the surface zone to below 27° F. and generally between 0° to 27° F. and preferably 20°–27° F., to create an increased sensible heat capacity and extracting the heat of fusion of said mass within the meat unit to freeze the mass and provide a latent heat capacity, withdrawing the packaged unit from contact with cold gaseous medium upon attaining an internal zone meat unit temperature of approximately 30° to 44° F. and a sufficient negative heat content reservoir to absorb all of the heat to be lost from the internal zone, and maintaining the packaged meat at a temperature above 28° F. for a sufficient time to absorb the sensible heat and latent heats from said internal zone into said negative zone capacity reservoir and equilibrate the temperature throughout the meat unit whereby to avoid natural meat juice weeping during storage, and activating the natural enzymes in the surface zone to effect improved tenderization.

3,637,406

ULTRAPURE ALUMINA CERAMICS FORMED BY COPRECIPITATION

Joseph T. Bailey, Hixson, Tenn., assignor to American Lava Corporation, Chattanooga, Tenn.

Continuation of application Ser. No. 746,316, July 22, 1968, now abandoned. This application Dec. 23, 1970, Ser. No. 101,150

Int. Cl. C04b 33/00

U.S. Cl. 106—39 R 8 Claims

Alumina ceramics of homogeneous composition and fine-grained structure are produced using alpha-alumina obtained by calcination of aluminum oxide hydroxide including any desired adjuvants.

3,637,407

COMPOSITION AND METHOD FOR SURFACE-SIZING PAPER AND THE LIKE

Ulrich Schobinger, Zug; Cla Christoffel, Waedenswil, and Kurt Berner, Pfaeffikon, all of Switzerland, assignors to Blattmann & Co., Waedenswil, Switzerland

Filed May 21, 1969, Ser. No. 826,658

Claims priority, application Switzerland, May 21, 1968, 7533/68

Int. Cl. C08h 25/02

U.S. Cl. 106—213 17 Claims

Paper and like webs are given improved surface properties and resistance to ink penetration by means of a composition, readily dispersible in water at about 65°–70° C., of a small proportion of higher ketene dimer with a highly water soluble dextrin phosphate having 0.3–3 percent of phosphorus molecularly bound therein and typically containing 1–3 percent of free phosphate, or with a mixture of a water soluble noncationic starch derivative of low viscosity and suitable alkali metal phosphate. A composition particularly valuable for sizing papers of high-alum content contains the dextrin phosphate and 4–8 percent of ketene dimer with up to 20 percent of guar flour, about 2–5 percent of sodium fluoride and about 3–5 percent of sodium carbonate.

3,637,408

DECORATIVE LAMINATES CARRYING REMOVABLE PROTECTIVE COATING

Jerry George Alert, Mount Carmel, and Robert Daniel Mauldin, Cincinnati, both of Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Filed May 26, 1969, Ser. No. 827,969

Int. Cl. B44d 5/00; C11d 9/46

U.S. Cl. 117—6 3 Claims

A decorative laminate carrying on its decorative surface a removable film of a mixture of a preponderant amount of a fatty acid soap a minor amount of a nonionic detergent and a coupling agent.

3,637,409

MANUFACTURE OF FLAME-RESISTANT NONWOVEN FABRICS

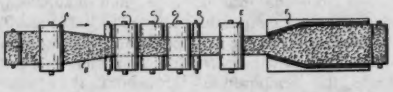
Ludwig Hartman, Oberflockenbach, Germany, assignor to Carl Freudenberg, Weinheim (Bergstr.), Germany

Filed July 30, 1968, Ser. No. 748,881

Claims priority, application Germany, Aug. 5, 1967, F 53156

Int. Cl. B05c 3/107; B29d 7/22

U.S. Cl. 117—7 8 Claims



Nonwoven fabrics are impregnated first with a conventional binder and then with a polyvinyl chloride-antimony trioxide binder. After the second impregnation the fabric is longitudinally stretched while it is being dried, rewetted with water, and then transversely stretched while it is being dried. Further there is disclosed a novel impregnant composition which is useful in fireproofing nonwoven fabrics.

3,637,410

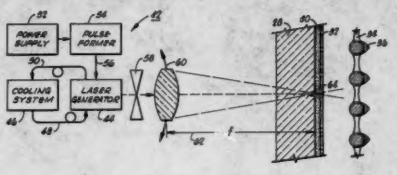
METHOD OF TREATING CATHODO-LUMINESCENT PHOSPHORS

Gary L. Stevens, 1631 Vine, Norman, Okla.

Filed Dec. 18, 1968, Ser. No. 784,860

Int. Cl. H01j 31/20

U.S. Cl. 117—8 8 Claims



A method of treating an expanse of phosphor material to remove selected spots which have interfering luminescent properties. The method consists of isolating and identifying spots or areas considered to be objectionable as regards the desired function of the particular phosphor, and then focusing a laser beam of selected wavelength at each spot whereupon the phosphor material absorbs the laser generated radiant energy to develop heat energy sufficient to effect vaporization of the spot of phosphor material.

3,637,411

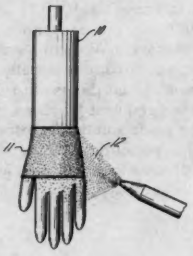
DUAL FINISH SURGEON'S GLOVE

Armand J. Agostinelli, East Haven, Conn., assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation of application Ser. No. 720,854, Apr. 12, 1968, now abandoned. This application Nov. 18, 1969, Ser. No. 871,679

Int. Cl. B44d 1/094; A61b 19/04

U.S. Cl. 117—18 7 Claims



A dual-finished rubber surgeon's glove having an external surface that is nonadherent to antifriction powders and an adherent powdered inside surface. Sufficient dust or powder is present on the inside to facilitate donning, while the absence of dust on the outside minimizes the possibility of introducing dust particles into surgical openings and causing infections or post operative adhesions.

3,637,412

LADLE LINING REFRACTORY

Frank T. Felice, Chicago; Robert E. Fisher, Clarendon Hills, and Louis J. Jacobs, Chicago, all of Ill., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 16, 1968, Ser. No. 760,094
Int. Cl. B44d 1/14; C04b 35/54, 35/66
U.S. Cl. 117—26 15 Claims

A refractory material for lining metallurgical ladles and the method of producing the same are disclosed. The material comprises refractory aggregate particles such as calcined flint clay which are coated with various materials including an outer coating of graphite which is covered with an elastic film of material such as aluminum phosphate binder. The graphite gives the refractory mixture the desirable properties and the film protects the graphite from oxidation and wear. The material is prepared in apparatus such as a pelletizer with an inclined revolving disk whereby the separate particles are each coated to produce a final mixture of discrete particles which are flowable and thus easy to handle. The refractory may be used as a monolithic lining or it may be formed into brick.

3,637,413

LUMINESCENT SCREEN AND METHOD OF MAKING THE SAME

Heinrich Jarczyk, Gross Bieberau, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed May 31, 1968, Ser. No. 733,281
Claims priority, application Germany, June 8, 1967, P 15 89 787.7
Int. Cl. H01j 31/12
U.S. Cl. 117—33.5 CS 8 Claims

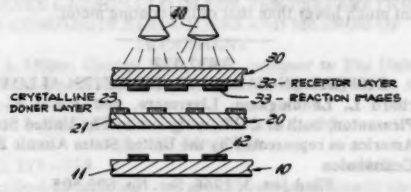
A luminescent screen free of binder material is produced in an electron discharge device by introducing into the envelope of the electron discharge device a suspension of a phosphor in a settling liquid in which a relatively small proportion of a swellable organic colloid is distributed which is capable of being decomposed with complete volatilization. The phosphor of the suspension is then allowed to settle in the envelope so as to form therein a phosphor layer which will include a portion of the settling liquid and the colloid. The settling liquid is then removed and the residual layer is heated in the envelope at an elevated temperature and for a period of time sufficient to cause volatilization of the colloid so that a phosphor layer remains which is free of binder material.

3,637,414

THERMOGRAPHIC TRANSFER SHEET

Douglas A. Newman, Glen Cove, and Herbert Knabe, Centereach, both of N.Y., assignors to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Continuation-in-part of application Ser. No. 692,164, Dec. 20, 1967, now abandoned. This application Mar. 16, 1970, Ser. No. 20,070
Int. Cl. B41m 5/22, 5/10
U.S. Cl. 117—36.2 6 Claims



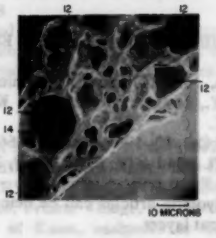
The heat-imaging of translucent plastic films for projection purposes using an imaged original sheet and infrared radiation characterized by the use of a transfer sheet having a heat-stable film foundation carrying a translucent heat transferable layer which is based mainly on a crystalline material carried by a resinous binder which softens and becomes adhesive during the heat-imaging process, the crystalline material being incompatible with the resin and providing the layer with a chalky appearance due to the refraction of light caused by its crystalline structure.

3,637,415

LEATHERLIKE MATERIAL

Frank Peter Civardi, Wayne, N.J., assignor to Inmont Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 780,477, Dec. 2, 1968. This application June 9, 1969, Ser. No. 831,664
Int. Cl. B44d 1/44; D06n 3/00
U.S. Cl. 117—62 12 Claims



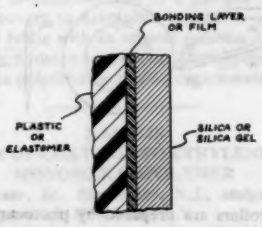
Surface treatment of water vapor-permeable sheet having a microporous surface of thermoplastic elastomeric polyurethane by applying discrete particles (such as fine droplets) of a solution of an elastomeric polyurethane containing dispersed pigment and collapsing the microporous structure at said surface.

3,637,416

METHOD OF TREATING SYNTHETIC PLASTIC AND ELASTOMERIC MATERIALS AND ARTICLES PRODUCED THEREBY

Robert D. Misch, and Donald A. Daus, both of Chicago, Ill., assignors to MBT Corporation, Chicago, Ill.

Continuation of application Ser. No. 636,258, May 5, 1967, now abandoned, Continuation of application Ser. No. 473,212, July 19, 1965, now abandoned, Continuation of application Ser. No. 524,454, Feb. 2, 1966, now abandoned, Continuation of application Ser. No. 231,299, Oct. 17, 1962, now abandoned. This application Feb. 4, 1970, Ser. No. 8,530
Int. Cl. B44d 1/14; G02c 7/04; C32b 27/68
U.S. Cl. 117—72 25 Claims



A method of improving the surface characteristics of plastics and elastomers which in its preferred aspects includes the steps of forming a bonding or coupling film of an organic silicon compound on the surface of a plastic or

elastomeric material and thereafter contacting the film with a compound or a mixture of compounds, or a solution thereof, capable of forming a deposit or coating of silica or silica gel thereon, and articles produced in accordance with the method.

3,637,417

EPOXY SILANE-IMIDAZOLE TREATMENT OF REINFORCEMENT MATERIAL

Harold A. Green, Havertown, Pa., assignor to Air Products and Chemicals, Inc., Philadelphia, Pa.

Filed Aug. 2, 1967, Ser. No. 657,755
Int. Cl. C03c *25/02*; B44d *1/16*
U.S. Cl. 117—76 T 10 Claims

Reinforcement material intended for reinforced plastic applications is treated with an epoxy silane and then reacted with an imidazole or an admixture of an imidazole and the resin system to be reinforced.

3,637,418

POLYOLEFIN ARTICLES HAVING EFFECTIVE OXYGEN BARRIERS

Billy R. Dotson, and Robert F. Williams, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 13, 1969, Ser. No. 866,015
Int. Cl. B44d *1/14*; B32b *27/08, 27/32*
U.S. Cl. 117—76 F 9 Claims

Laminated polyolefin articles can be manufactured by applying two overcoat layers.

1. The first overcoat layer, in contact with the polyolefin, is of a film-forming materials selected from the group consisting of maleated polyethylene and vinyl ether/maleic anhydride copolymers.

2. The second layer, applied over the first overcoat layer is of a material selected from the group consisting of poly(vinyl alcohols), poly(vinylidene chlorides) and chemically hardened gelatin.

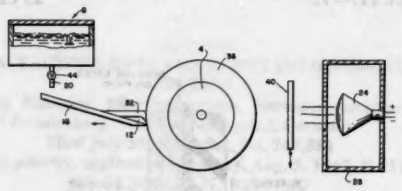
The resulting articles have very low permeability to gases such as oxygen.

3,637,419

METHOD OF COATING RIGID CORES AND PRODUCT THEREOF

Christian B. Lundsager, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,503
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 18 Claims



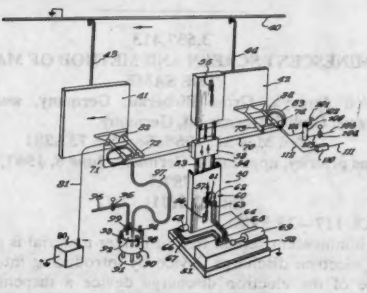
Industrial rollers are prepared by photocuring a layer of photocurable composition on the rigid core and then photocuring a layer of diluted photocurable composition to obtain a smooth uniform glazelike finish. As the core cylinder is rotated, a thin layer of photocurable composition is fed intermittently or continuously onto the rotating cylinder, where it can optionally be smoothed by a doctor blade. The photocurable composition preferably is photocured by an ultraviolet light source which is located on the cylinder side opposite the place where the photocurable composition is applied so that premature hardening does not occur in the feed stock. Multiple, consecutive layers of photocurable composition can be built up on the rigid core, each (after the first) being placed upon a partially hardened photocured sublayer. In this manner, the photocured material on the rigid core can be built up to any desired and practical thickness. A solvent-diluted photocurable composition is then coated on the coated core and photocured to furnish the smooth glazelike finish. Toluene is the preferred solvent.

3,637,420

METHOD OF ELECTROSTATICALLY COATING WITH HIGHLY CONDUCTIVE MATERIALS

Arvid C. Walberg, Lombard, Ill., assignor to Graco, Inc., Minneapolis, Minn.

Division of Ser. No. 580,468, Sept. 19, 1966, Pat. No. 3,463,121
Filed Aug. 22, 1969, Ser. No. 852,187
Int. Cl. B05b *5/02*
U.S. Cl. 117—93.42 4 Claims



Work is electrostatically coated with highly conductive materials by air or hydrostatic atomizing spray guns. The rate of material application to work for water base material such as porcelain enamel is high being in excess of 3 mils of film thickness in less than 60 seconds to prevent "dry spray." The problem of "dry spray" is further controlled by placing the spray guns very close to the work (less than 12 inches).

3,637,421

VACUUM VAPOR COATING WITH METALS OF HIGH VAPOR PRESSURE

Joseph Paul Gimigliano, c/o Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 663,953, Aug. 29, 1967, now abandoned. This application Aug. 27, 1969, Ser. No. 853,525
Int. Cl. C23c *13/02*
U.S. Cl. 117—107 10 Claims

The substrate is vacuum vapor coated with a metal having a high vapor pressure at its melting point so that it tends to sublime by evaporating the coating metal from a binary alloy of the coating metal and a second metal, the alloy having a melting point lower than that of the coating metal, and the second metal having a vapor pressure at the alloy melting point much lower than that of the coating metal.

3,637,422

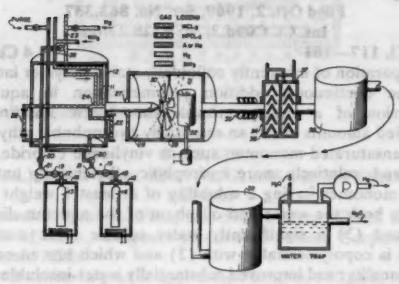
DISPERSION-HARDENED TUNGSTEN ALLOY

Richard L. Landingham, Livermore, and James S. Kane, Pleasanton, both of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 3, 1968, Ser. No. 695,505
Int. Cl. C23c *11/02*
U.S. Cl. 117—107.2 R 7 Claims

Dispersion-hardened tungsten and tungsten alloy coatings having a material such as hafnium nitride at a concentration

above 0.5 percent by volume are produced by covapor depositing tungsten and hafnium nitride. The hafnium nitride is produced in situ by addition of ammonia or nitrogen to a



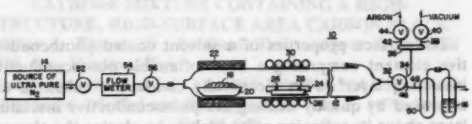
reducing atmosphere of hydrogen, which is mixed with tungsten and hafnium halide vapors in the presence of a substrate mandrel heated to a temperature above 900° C.

3,637,423

PYROLYTIC DEPOSITION OF SILICON NITRIDE FILMS

Donald E. Sestrich, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 10, 1969, Ser. No. 798,056
Int. Cl. C23c *11/14*
U.S. Cl. 117—106 R **11 Claims**



Silicon nitride films are prepared on graphite and other suitable substrates by the vapor phase pyrolysis of a silicon halide-ammonia adduct and preferably a silicon tetrafluoride-ammonia adduct ($SiF_4.2NH_3$).

3,637,424

TREATED CARBON CLOTH FOR THE PREPARATION OF COMPOSITE STRUCTURES AND METHOD OF TREATMENT

Leroy J. Miller, Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed June 11, 1969, Ser. No. 832,495
Int. Cl. B44d *5/12*
U.S. Cl. 117—118 **4 Claims**

A method for treating carbon cloth with an aromatic disulfonic acid and the treated cloth produced thereby. The method comprises the steps of (1) wetting the carbon cloth (or fibers) with a molten disulfonic acid or a solution of the disulfonic acid; (2) drying the cloth by evaporation of the solvent, if a solvent is used, leaving the disulfonic acid behind to coat the fibers; (3) heating the disulfonic acid coated cloth to a temperature at which the acid can react with the surface of the cloth and/or with itself; (4) washing the coated cloth with solvent to remove any excess, unreacted disulfonic acid; and (5) drying the cloth by evaporating away the washing solvent. The cloth prepared by the above method is useful as a reinforcing material in composite structure.

3,637,425

AN INSULATING COATING ON SILICON

Peter William McMillan; Graham Partridge, and Frank Russell Ward, all of Stafford, England, assignors to The English Electric Company Limited, London, England

Filed Nov. 17, 1967, Ser. No. 683,781
Claims priority, application Great Britain, Nov. 17, 1966, 51,549/66; Canada, Nov. 2, 1967, 4,092
Int. Cl. C03c *1/00, 27/00*
U.S. Cl. 117—125 **8 Claims**

Silicon is bonded or coated with a glass-ceramic containing as major constituents ZnO, Al_2O_3, SiO_2 and either B_2O_3, BaO or CaO; alkali metals, Ge and Mg. are absent.

3,637,426

METHOD FOR PREPARING COMPOSITE FILMS OF POLYVINYLIDENE CHLORIDE AND ETHYLENE-ACRYLAMIDE COPOLYMERS

Francis R. Galiano, Prairie Village, and David Rankin, Kansas City, both of Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 1, 1968, Ser. No. 749,306
Int. Cl. B32b *27/08*
U.S. Cl. 117—138.8UA **1 Claim**

A composite thermoplastic film of polyvinylidene chloride and copolymers of ethylene and amides of lower alkyl acrylates and their homologs is prepared without primer or adhesive by coating a film of the ethylene-amide copolymer with the polyvinylidene chloride.

3,637,427

PROCESS FOR IMPARTING HIGH-ELASTIC RECOVERY TO EXTENSIBLE KNITTED OR WOVEN FABRICS AND PRODUCT OBTAINED

Motohiro Tsuruta, Kyoto-shi; Hiroshiro Kimura; Akio Koshimo; Hirohisa Nara, all of Kyoto-fu; Tokuju Goto, Nara-shi; Kunio Amemiya, and Hideki Matusaka, both of Kyoto-fu, all of Japan, assignors to Nippon Rayon Kabushiki Kaisha (Nippon Rayon Co., Ltd.), Kyoto-fu, Japan

Filed Sept. 20, 1968, Ser. No. 761,336
Claims priority, application Japan, Jan. 13, 1968, 43/1829
Int. Cl. D06m *15/66*
U.S. Cl. 117—138.8 A **9 Claims**

The present invention relates to a process for imparting high-elastic recovery to extensible knitted or woven fabrics by treating the fabric with an organic solution of low-viscosity containing a hydroxy-terminated dimethylpolysiloxane, a methylhydrogen polysiloxane and an organometallic catalyst.

3,637,428

ADHESION OF COATINGS TO ETHYLENE-POLAR MONOMER COPOLYMER

John F. Aleckner, Jr., Bloomfield, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 10, 1968, Ser. No. 782,719
Int. Cl. B32b *27/08, 27/32*
U.S. Cl. 117—138.8 E **7 Claims**

The adhesion of coatings to ethylene-polar monomer copolymer substrates is enhanced by the use, as an adhesion promoter, of vinyl acetate polymer.

3,637,429

IMPREGNATED CELLULOSIC SHEET MEMBERS WHEREIN IMPREGNANT IS A C^8–C^{13} CARBOCYCLIC SUBSTITUTED RESOLE

George J. Anderson, Wilbraham, and Ronald H. Dahms, Springfield, both of Mass., assignors to Monsanto Company, Saint Louis, Mo.

Continuation-in-part of application Ser. No. 588,310, Oct. 21, 1966, now abandoned. This application June 21, 1968, Ser. No. 738,797

Int. Cl. C08g *5/08, 37/10, 37/18*

U.S. Cl. 117—143 A 9 Claims

Cellulosic substrates impregnated with a phenol-formaldehyde resin using a phenol which has been previously substituted with a specific C_8 through C_{13} mixture of carbocylic compounds. The resulting impregnated sheets display an improved combination of properties including good tensile strength and flexibility, and are especially useful as filter media and as intermediates for the manufacture of laminates.

3,637,430

CELLULOSIC SUBSTRATES IMPREGNATED WITH A CYCLOPENTADIENE DIMER SUBSTITUTED RESOLE

Ronald H. Dahms, Springfield, and George J. Anderson, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed July 25, 1968, Ser. No. 747,498. The portion of the term of the patent subsequent to Nov. 3, 1987, has been disclaimed.

Int. Cl. C08g *5/08, 37/10, 37/18*

U.S. Cl. 117—143 A 11 Claims

Cellulosic substrates impregnated with a phenol-formaldehyde resin using a phenol which has been previously substituted with a specific mixture of cyclopentadiene codimers. The resulting impregnated sheets display an improved combination of properties including good tensile strength and flexibility, and are especially useful as filter media and as intermediates for the manufacture of laminates.

3,637,431

COATING COMPOSITION AND ARTICLE COATED WITH SAME

Richard S. Brenneman, Natick; John J. Clancy, Westwood; William T. MacLeish, Andover, and Robert C. Wells, Arlington, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Sept. 30, 1968, Ser. No. 763,884

Int. Cl. D21h *1/38, 1/34*

U.S. Cl. 117—155 UA 13 Claims

An emulsion coating composition and a substrate coated therewith. The aqueous phase of the coating contains a blend of resinous materials, one resin component, such as casein, forming a matrix structure and the other, such as an acrylic polymer, forming an essentially continuous film. The coating after drying contains small air-binder interfaces which scatter light. The resin components making up the binder may be chosen to give the coating a wide range of physical and chemical properties.

3,637,432

PREPARATION OF INHERENTLY COLLOIDALLY STABLE INTERPOLYMER LATEXES BY A CONTINUOUS ADDITION POLYMERIZATION TECHNIQUE AND ARTICLES COATED THEREWITH

Dale S. Gibbs; Ritchie A. Wessling, and Earl H. Wagener, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1969, Ser. No. 863,337

Int. Cl. C09d *3/74;* B32b *27/06*

U.S. Cl. 117—161 4 Claims

Preparation of inherently colloidally stable polymer latexes by the continuous, addition polymerization in aqueous dispersion of a copolymerizable monomeric mixture of specified amounts of (1) an essentially hydrophobic ethylenically unsaturated monomer, such as vinylidene chloride, (2) a second, relatively more hydrophilic ethylenically unsaturated monomer having a solubility of at least 1 weight percent in both the water and oil phase of the aqueous dispersion and (3) a significantly water soluble ionic material which is copolymerizable with (2) and which has an onium functionality; and improved substantially water-insoluble substrates having a coating of the dried residue of such aqueous dispersion thereon.

3,637,433

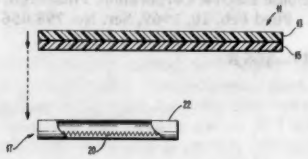
PROCESS FOR IMPROVING PHOTOCONDUCTIVE ELEMENTS

Jimmy A. Sims, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1969, Ser. No. 852,018

Int. Cl. B44d *1/18*

U.S. Cl. 117—201 10 Claims



The surface properties of a solvent coated photoconductive element comprising a heat softenable photoconductive insulating layer on an electrically conductive substrate are improved by quickly heating the photoconductive insulating layer above its softening point such as by placing the element in contact with a heated member for a short period of time.

3,637,434

VAPOR DEPOSITION APPARATUS

Sho Nakanuma; Yuichi Haneta; Keizo Fujimori, and Toshio Wada, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 4, 1969, Ser. No. 874,002

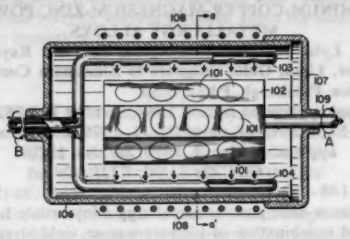
Claims priority, application Japan, Nov. 7, 1968, 43/81716

Int. Cl. C23c *13/08;* B05c *11/14*

U.S. Cl. 117—201 5 Claims

An apparatus is provided for vapor depositing an epitaxial semiconductor layer or film on a semiconductor substrate comprising a susceptor of prismatic configuration supported along its longitudinal axis. The susceptor is confined within a housing to shield it from the external environment. A gas inlet pipe with at least one slit or orifice therealong is provided within the housing along one side of the susceptor and an outlet pipe also with at least one slit or orifice for exhausting gas substantially diametrally opposite the inlet pipe along the other side of the susceptor. The surface of the susceptor is provided with holding means for supporting semiconductor substrates. The apparatus has means for heating the susceptor and means for effecting relative axial rotation as between the pipes and the susceptor about the longitudinal axis of the

susceptor. Preferably, the susceptor and pipes are rotated in



mutually opposite directions.

3,637,435

METALLIZING PROCESS FOR GLASS-FREE CERAMICS BODIES

Raymond E. Schwyn, Flint, and Morris Berg, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of application Ser. No. 597,868, Nov. 30, 1966, now abandoned. This application July 8, 1969, Ser. No. 840,007

Int. Cl. C04b *41/14*

U.S. Cl. 117—227 **5 Claims**

This invention relates to sintered, substantially glass-free, ceramic bodies, and more particularly to an improved method of producing a metallized surface on such ceramic bodies. The method includes coating a sintered ceramic body with a metallizing ink composition containing a metal from the group molybdenum, tungsten, and mixtures of each of such metals with manganese, and subsequently firing the coated ceramic body in a wet reducing atmosphere to oxidize the metal from said first-mentioned group to yield a metallic layer which is tightly bonded to the surface of the ceramic body. The oxide of the metal from said first-mentioned group bonds directly to the ceramic body which in turn mechanically adheres the metal layer, from said second-mentioned group, to the ceramic body.

3,637,436

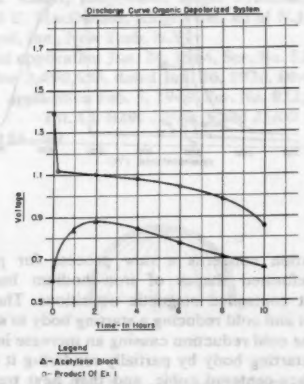
CATHODE MIXTURE CONTAINING A HIGH-STRUCTURE, HIGH-SURFACE AREA CARBON BLACK

Fletcher A. Hinson, Jr., Portland, Tex., assignor to Ashland Oil, Inc., Houston, Tex.

Original application July 13, 1966, Ser. No. 564,667, now abandoned. Divided and this application May 5, 1970, Ser. No. 46,569

Int. Cl. H01m *21/00, 13/02, 15/06*

U.S. Cl. 136—83 R **16 Claims**



A cathode mixture for a cell which contains a furnace carbon black having a surface area (iodine adsorption) of about 600 m.²/gram to about 1300 m.²/gram, a structure level as measured by oil factor of about 250 to about 450 milliliters per 100 grams of carbon, a pH of about 6 to about 10, and an ash content of about 0.5 percent to about 10 percent.

3,637,437

RANEY METAL SHEET MATERIAL

Max Goldberger, Wapping, Conn., assignor to Catalytic Technology Corporation, Manchester, Conn.

Continuation-in-part of application Ser. No. 447,551, Apr. 12, 1965, Continuation-in-part of application Ser. No. 408,217, Nov. 2, 1964, now abandoned , Continuation-in-part of application Ser. No. 761,880, Sept. 23, 1968. This application June 3, 1970, Ser. No. 43,220

Int. Cl. H01m *13/06*

U.S. Cl. 136—120 FC **10 Claims**

A Raney metal catalytic sheet material is prepared by spraying molten particles of a Raney alloy, such as a silver, nickel, iron, platinum or cobalt alloy with aluminum on a substrate, and leaching aluminum from the alloy. The sheet catalyst is claimed as is the process of manufacture.

3,637,438

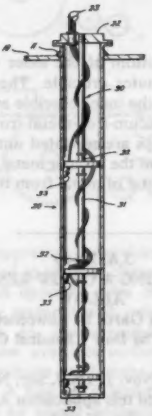
THERMOCOUPLE GUIDE

Redwood L. Springfield, 3827 Sun Valley, Houston, Tex.

Filed May 13, 1965, Ser. No. 455,402

Int. Cl. H01v *1/00, 1/02*

U.S. Cl. 136—230 **10 Claims**



A flexible central support having a plurality of hollow guides spirally wrapped therearound, and individual thermocouple cables removably inserted within each guide. Spiderlike positioners are spaced along the support to extract individual guides and lead the remainder to their proper location.

3,637,439

PROCESS AND APPARATUS FOR PULLING SINGLE CRYSTALS OF GERMANIUM

Edouard DeBie, Antwerpen, Belgium, assignor to Metallurgie Hoboken, Montagne du Parc, Brussels, Belgium

Filed July 2, 1969, Ser. No. 838,393

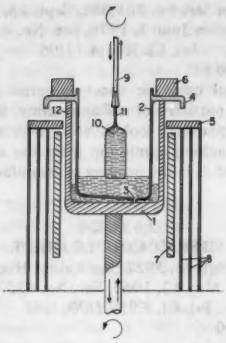
Claims priority, application Belgium, Nov. 13, 1968, 65987

Int. Cl. B01j *17/00;* **H01l** *7/00*

U.S. Cl. 148—1.6 **3 Claims**

A process and apparatus for separating scum from molten metal, particularly germanium, and the pulling of single

crystals with the use of outer and inner crucibles. The metal is placed in the outer crucible and there melted. In the inner crucible is weighted with a ballast to ensure its penetration into the molten metal and to avoid its flotation on the molten metal. The outer crucible is then lifted and rotated to segregate the scum from the molten metal and to introduce the metal from the outer to the inner crucible through an orifice provided in the bottom of the inner crucible while the scum remains in the outer crucible. The outer crucible is then lowered to empty the inner crucible and again lifted and rotated to reintroduce scum-free metal from the outer to the inner crucible. The steps are repeated until all traces of the scum are separated from the molten metal, which is followed by growing a single crystal of metal from the scum-free metal in the inner crucible.



3,637,440

METHOD OF MAKING A CREEP RESISTANT LEAD ALLOY

George S. Foerster, and Garth D. Lawrence, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Original application Nov. 1, 1967, Ser. No. 679,621, now abandoned. Divided and this application Apr. 24, 1970, Ser. No. 31,801

Int. Cl. C22f *1/12*; C22c *11/00*

U.S. Cl. 148—11.5 R **13 Claims**

The present invention comprises a creep resistant lead base alloy characterized by finely dispersed intermetallic compound and containing, by addition, at least one solid soluble alkali or alkaline earth metal component prealloyed with lead which is selected from Groups IA and IIA of the Mendeleeff Periodic Chart of the atoms, and at least one metalloid component selected from Group VB of said atomic chart, the balance being essentially lead, and a method of preparing said alloy. The method of making said creep resistant lead base alloy comprises: (a) dissolving the selected alkali or alkaline earth metal in molten lead, (b) particulating the mass from the molten form to provide a prealloy, (c) intimately and homogenously contacting said solid, particulate prealloy with the metalloid component, and (d) diffusing said metalloid component into the prealloy at an elevated temperature to form an essentially insoluble intermetallic compound finely dispersed throughout a final creep resistant lead base alloy.

3,637,441

ALUMINUM-COPPER-MAGNESIUM-ZINC POWDER METALLURGY ALLOYS

John P. Lyle, Jr., New Kensington, Pa., and Raymond J. Towner, Lima, Ohio, assignors to Aluminum Company of America, Pittsburgh, PA

Original application Apr. 8, 1968, Ser. No. 719,752, now Patent No. 3,544,394, dated Dec. 1, 1970. Divided and this application Mar. 2, 1970, Ser. No. 18,781

Int. Cl. C22c *21/00*; C22f *1/04*

U.S. Cl. 148—32.5 **5 Claims**

Aluminum base powder metallurgy alloy article having an improved combination of high-transverse yield strength and high-stress corrosion cracking resistance. The alloy contains the basic precipitation hardening elements zinc, magnesium and copper plus dispersion strengthening elements iron and nickel. It may additionally contain chromium and/or manganese. The alloy is prepared by atomization of a melt of the elements, hot-working, solution heat treating, quenching and artificial aging. Components of the alloy in percent by weight are, in addition to the aluminum, from at least 6.5 to 13 zinc, 1.75 to 6 magnesium, 0.25 to 2.5 copper, 0.75 to 4.25 iron and 0.75 to 6 nickel, up to 3 manganese and up to 0.75 chromium. The iron to nickel ratio is from 0.2:1 to 2.0:1.

ERRATUM

For Class 148—111 see:
Patent No. 3,636,579

3,637,442

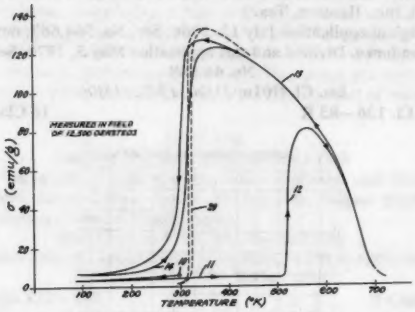
PROCESS FOR PRODUCING PLASTICALLY DEFORMED IRON-RHODIUM BASE ALLOY BODIES

James S. Kouvel, Colonie; James M. Lommel, Niskayuna, and Thomas E. Douglas, Rotterdam, all of N.Y., assignors to General Electric Company

Filed Feb. 13, 1967, Ser. No. 615,433

Int. Cl. H01f *1/00*

U.S. Cl. 148—120 **4 Claims**



This invention concerns a new process for producing plastically deformed shapes of iron-rhodium base alloys which exhibit controlled magnetic transitions. The process comprises hot and cold reducing a starting body to some final dimension, the cold reduction causing an increase in the ductility of the starting body by partially rendering it crystallographically face-centered cubic, and then heat treating the final body at a temperature no lower than about 235° C. to produce a CsC1-type ordered crystal structure having an

abrupt magnetic transition. Subsequent cold reducing of the heat-treated body by varying amounts alters the nature of the magnetic transition.

3,637,443

METHOD FOR ANNEALING MAGNETIC WIRE

Lloyd D. Ransom, Torrance, Calif., assignor to Motorola, Inc.

Filed Nov. 28, 1969, Ser. No. 880,860
Int. Cl. H01f *1/12*; B32b *15/00*, *15/20*
U.S. Cl. 148—122 1 Claim

A conductive wire which is plated with a magnetic coating is annealed in an oxygen environment. The resulting oxides are removed to provide good electrical contact for online testing.

3,637,444

PROCESS OF MAKING DETERRENT-COATED AND GRAPHITE-GLAZED SMOKELESS POWDER

John O. Bonyata, Mountain Lakes, and Lynn G. Rohrbaugh, Lake Hopatcong, both of N.J., assignors to Hercules Incorporated, Wilmington, Del.

Filed Apr. 14, 1969, Ser. No. 816,023
Int. Cl. C06b *19/02*
U.S. Cl. 149—10 20 Claims

An improved process for manufacture of deterrent-coated and graphite-glazed smokeless powder is provided with deterrent coating and graphite glazing being done in an aqueous slurry at elevated temperatures.

3,637,445

METHOD FOR MAKING EXPLOSIVE OIL IMPREGNATED SENSITIZER GELLED AQUEOUS EXPLOSIVE SLURRY

Philip G. Newman, Kenvil, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 26, 1968, Ser. No. 779,240
Int. Cl. C06b *1/04*
U.S. Cl. 149—50 8 Claims

A process for preparing gelled aqueous explosive slurries having increased detonation velocity and sensitivity while employing densified nitrocellulose particles as the sensitizing agent is disclosed. The increase in detonation velocity and sensitivity are achieved by impregnating the densified nitrocellulose particles with an explosive oil in the form of an aqueous emulsion in which the aqueous phase is a solution of water and water-soluble oxygen-containing salt.

3,637,446

MANUFACTURE OF RADIAL-FILAMENT SPHERES

Daniel R. Elliott, Ridgewood; Edgar Francois, Wayne, and Donald C. MacDonald, Ridgewood, all of N.J., assignors to Uniroyal, Inc., New York, N.Y.

Original application Jan. 24, 1966, Ser. No. 522,675, now Patent No. 3,490,638, dated Jan. 20, 1970. Divided and this application Feb. 3, 1969, Ser. No. 822,769
Int. Cl. B29c *27/10*; B29d *25/00*
U.S. Cl. 156—69 6 Claims

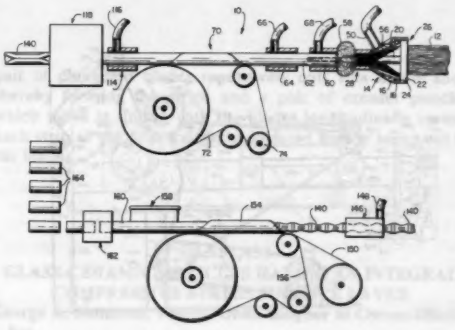
Making a shell-type body of spherical curvature by various methods which include the butt edge bonding in a spherical configuration of segments of resin/reinforced by short length high-modulus filaments extending substantially normal to the inner and outer surfaces of the segments and preferably through the entire segment thickness whereby the filaments are disposed generally radially with respect to the curvature of the body. Complete spheres of this construction are particularly suited for deep submergence work under high-external hydrostatic pressures, being characterized by a low weight to displacement ratio and a high-compressive strength to weight ratio. The full nature and extent of the invention is discernable only by reference to the entire disclosure.

3,637,447

METHOD OF MAKING FILTER MEANS BY CRIMPING AND OVERWRAPPING A TUBULAR ELEMENT

Richard M. Berger, Richmond, and Elwin W. Brooks, Mechanicsville, both of Va., assignors to American Filtrona Corporation, Richmond, Va.

Continuation-in-part of application Ser. No. 727,477, May 8, 1968, now Patent No. 3,533,416, and a continuation-in-part of 820,355, Apr. 30, 1969. This application June 10, 1970, Ser. No. 45,109
Int. Cl. B29h *9/02*
U.S. Cl. 156—180 5 Claims



A method and apparatus for making filter means of a type which is constructed to provide elongated, high-surface area, cavities defined on opposite sides of a relatively thin wall formed of filtering material with only the ends of the filter means contacting an overwrapped outer tube thereby presenting maximum available surface area of the material from which the products are formed to the smoke for filtration is disclosed. A tow of a suitable filtering material is passed through an air nozzle containing a mandrel centered therein, the tow thereby achieving a uniformly random, but tubular, configuration and then through a steam-curing station followed by an air-curing station. The formed rod is then again steam cured and passes to a crimping device which imparts a particular configuration thereto. The crimped rod is then again air cured, wrapped, and cut. In another embodiment, an addition material may be added by means either of a printing applicator device or a pulsating nozzle device.

3,637,448

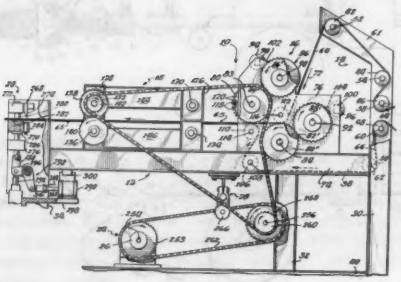
LAMINATING METHOD FOR HONEYCOMB

Burton L. Siegal, Skokie, Ill., and Steve Herndon, deceased, late of Fredericktown, Ohio (by Nancy Herndon, executrix), assignors to Orbitex, Inc., Miami, Fla., by said Siegal

Filed Feb. 12, 1968, Ser. No. 705,885
Int. Cl. B31d *3/02*
U.S. Cl. 156—197 5 Claims

There is described a novel method and a laminating machine useful to perform said method, all for the production of unexpanded honeycomb laminate, which machine in-

cludes a printing stage for application of adhesive upon the upper and lower faces of the upper one of a pair of webs transverse to the direction of travel of said webs and in the form of spaced parallel lines; said printing stage including means for laminating the printed one of said pair of webs to the clean web during the application of the adhesive; a tractive or draw stage which receives the printed, laminated pair of webs from the printing stage and transports same to a severing stage where the webs are cut between the adhesive lines whereat severance of the webs to sheets of predetermined length is accomplished without disturbance of said adhesive lines; the described invention also including a framework for mounting said stages thereon, drive means, including a motor and chain drive, capable of driving the printing and draw stages at a differential rate one relative to the other with the draw stage operated at a slightly greater speed than the printing stage so that the webs are held taut in transport to the severing stage; and, control means for actuating the severing of the webs into said sections of length, said control means being operated as a function of the number of lines of adhesive printed upon one of the upper or lower web faces of said printed web and there being means for compensating for the relative speed of the webs and the inertia of the



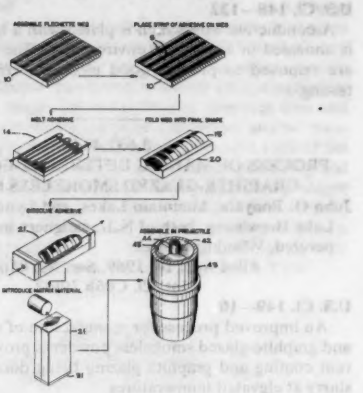
actual severing means utilized at the severing stage. The severing means at the severing stage is actuated when a predetermined condition being reached, said condition being a function of the number of printed lines and being capable of presetting to any value. A proximity detector is utilized as sensing means in a relay circuit to count the number of lines printed by monitoring the rotation of one of the printing rollers of the printing stage, said count being transmitted to tabulating means which is present to actuate the severing means upon a predetermined count, said circuit-tabulating means including a DC solenoid valve system for causing movement of the severing means, and also includes means for actuating the severing means while tallying the count to a retallying condition so that counts are not lost during the motion of the severing means. Guide means are described for monitoring and adjusting the alignment of the webs and a pneumatically operated solenoid actuated blade system is provided as the severing means for the severing stage, said system including a fixed blade positioned above the webs and a movable blade position below the webs, a pneumatic cylinder system for actuating the movable blade toward the fixed blade and said solenoid valve system being operable upon said cylinder system to drive the movable blade for severance of the web.

3,637,449

PROCESS FOR PREPARATION OF MISSILES

Harry Raech, Jr., San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 20, 1969, Ser. No. 800,971
Int. Cl. F42b *13/32*
U.S. Cl. 156—305 **12 Claims**



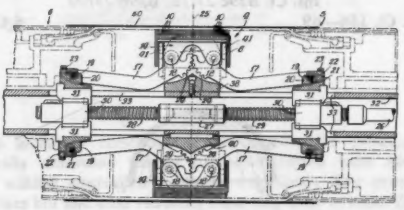
A method, or process, is disclosed of preparing flechettes in packs for insertion in a projectile, and a flexible web of flechettes, which is formed during the process, is also disclosed. In preparation of the pack, the flechettes are initially arranged on a rack in an interdigitated array, and a soluble, elastic adhesive is applied, in strip form, to the array. After the strips of adhesive are melted into the array, a flexible web is formed which can be removed from the rack. The web is folded into a mold with an internal cavity in the shape of a pack suitable for insertion into a projectile. A solvent is passed through the mold to dissolve the adhesive, and a matrix material is introduced in liquid form into the mold. The matrix binds the flechettes into a frangible pack which is then installed in a projectile.

3,637,450

MECHANISM FOR EFFECTING MOVEMENT OF A TIRE BUILDING DRUM DECK

Emerson C. Bryant, South Bend, Ind., assignor to National-Standard Company, Niles, Mich.

Filed Jan. 20, 1970, Ser. No. 4,285
Int. Cl. B29h *17/16, 17/26*
U.S. Cl. 156—415 **2 Claims**



A platform moving mechanism for effecting movement of platform means, such as the deck segments of a tire-building

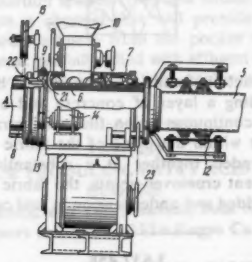
machine having an annular expandable drum defined by a plurality of circumferentially arranged deck segments each having a plurality of supporting members extending circumferentially of the drum in spaced apart side-by-side relation, and which are in end to end interleaved relation between adjacent deck segments, and in which the deck segments are movable radially to effect relative circumferential movement of the supporting members to define substantially cylindrical supporting surfaces of different radii, in which the platform moving mechanism is formed by opposed pusher arms lying in planes extending axially of the drum pivoted at their inner ends to the deck segments and pivoted at their outer ends to pusher rings movable axially toward and away from each other, and in which the inner ends of the pusher arms are provided with meshing gear teeth so that as the pusher rings are moved axially toward and away from each other, the deck segments are moved conjointly radially inwardly and outwardly to provide for the desired radial positioning of the deck segments and consequently the circumferential positioning of the supporting members so that the outer surfaces of the latter define substantially concentric supporting surfaces at any position of the pusher rings with respect to each other.

3,637,451

DEVICE FOR APPLYING HEAT-INSULATING SUBSTANCES ONTO PIPES

Vladimir Alexeevich Gusev, ulitsa Malaya Podvalnaya, 14, kv. 9, and Nikolai Nikolaevich Rudenko, ulitsa Kikvidze, 13-a, kv. 10, both of Kiev, U.S.S.R.

Filed Aug. 14, 1969, Ser. No. 850,028
Int. Cl. B22d *7/10*; B29b *5/04*
U.S. Cl. 156—500 **4 Claims**



A device disclosed for applying heat-insulating substances onto pipes, wherein a pipe being insulation-coated is progressively displaced inside a hollow auger enclosed in a cylindrical casing and designed to feed and consolidate the substance being applied onto the pipe. The device makes it possible to apply onto pipes coatings of insulating substances having a volume weight of 400 kg./sq.cm. and less, which is attained owing to the fact that on the side of the outlet end of the casting there is mounted a ring element progressively displaceable together with the pipe and serving to limit the extrusion of insulating substance from the casing, while at the outlet end of the casing there is mounted a device for winding a band of elastic material onto the surface of the insulation-coated pipe.

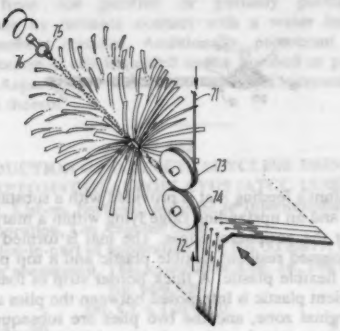
3,637,452

DECORATIVE SHEETING AND GARLAND

Frederick M. Sanders, 8338 N. Sunnyside Ave., Clovis, Calif.

Filed June 3, 1970, Ser. No. 42,949
Int. Cl. A41g *1/00*; A47g *33/08*
U.S. Cl. 161—15 **10 Claims**

Decorative polymer sheeting comprising a longitudinal web portion positioned centrally widthwise thereof, a multiplicity of elongated strips integral with said web portion and extending outwardly from both sides thereof and a permanent crease on each strip extending over a substantial portion of its length is continuously made by passing a continuous thin, deformable polymer sheet through a die in which a



pair of elongated blades repetitively cuts slits in the sheet thereby forming the strips and a pair of creaser punches which move in unison with the blades longitudinally creases each strip as the next following adjacent strip is being cut by the blades.

3,637,453

GLASS-CERAMIC ARTICLES HAVING AN INTEGRAL COMPRESSIVE STRESS SURFACE LAYER

George A. Simmons, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Continuation-in-part of application Ser. No. 558,238, June 17, 1966, Original application Oct. 4, 1967, Ser. No. 672,711, now Patent No. 3,498,775. Divided and this application Oct. 7, 1969, Ser. No. 871,026
Int. Cl. C03c *3/22*, *21/00*
U.S. Cl. 161—43 **7 Claims**

A glass-ceramic article is made from a glass composition, the glass-ceramic breaking or dicing like thermally tempered glass instead of producing fragments with sharp and pointed edges. One method of making such a glass-ceramic article is by heat-treating a thermally crystallizable glass having the following composition:

INGREDIENTS	PERCENT BY WEIGHT
SiO_2	70.4
Al_2O_3	15
MgO	4
CaO	3
Li_2O	1.6
TiO_2	2
ZrO_2	1
Na_2O	3
F	0.2

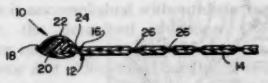
to provide by bulk crystallization a glass-ceramic article, ion-exchanging the surface of the article, heating the ion-exchanged glass-ceramic article to provide additional crystallization, and thermally tempering the resultant article.

3,637,454

FEEDING MAT

Stanford Pavernick, c/o Aljen Manufacturing Co., 115 Grand St., New York, N.Y.

Filed Sept. 12, 1969, Ser. No. 857,522
Int. Cl. B32b *1/04*; B65d *1/34*
U.S. Cl. 161—44 4 Claims



An infant's feeding mat is provided with a substantially flat bottom and an upstanding ridge lying within a marginal zone adjacent the peripheral edges. The mat is formed of a base ply of foamed resilient flexible plastic and a top ply of non-foamed flexible plastic. A thick border strip of foamed flexible resilient plastic is interposed between the plies and within the marginal zone, and the two plies are subsequently heat sealed to one another along their peripheries. An additional heat sealed seam between the plies surrounds the inner border of the strip and encloses the strip. The strip is held under compression between the plies and imparts the ridge to the mat.

3,637,455

PREFABRICATED BOW FORMS

Walter C. Pearson, St. Paul; Edward R. Quinn, Burnsville, and Dorman N. Thompson, North St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of application Ser. No. 791,992, Jan. 17, 1967, now abandoned. This application Jan. 2, 1970, Ser. No. 320
Int. Cl. D04d *7/10*
U.S. Cl. 161—49 2 Claims

Apparatus for mechanically fabricating prefabricated bow forms from two strips of decorative ribbon material and including a drawstring partially bonded to the ribbon, said apparatus comprising a ribbon and drawstring supply, motor means, a ribbon bonding assembly for bonding said ribbon materials together at spaced points, a ribbon advancing means and a ribbon cutoff means. A simple method of forming decorative bows from the prefabricated bow forms is also disclosed, said method comprising accumulating the bonded areas of said prefabricated bow forms one upon another, simultaneously forming loops of ribbon on either side of said bonded areas, by means of the drawstring.

3,637,456

PROCESS FOR REINFORCING POLYVINYL CHLORIDE MECHANICAL FOAMS, AND IMITATION LEATHER MADE FROM SUCH FOAMS

Gerard Mao, Collonges au Mont D'Or, France, assignor to Etablissements A. Chomarat & Cie, Paris, France

Filed May 7, 1970, Ser. No. 35,503
Claims priority, application France, May 8, 1969, 5912924
Int. Cl. B32b *5/08, 5/18, 7/00*
U.S. Cl. 161—64 6 Claims

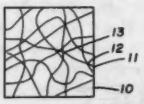
A polyvinyl chloride foam obtained by beating a plastisol is reinforced by incorporating textile fibers into the foam, before, during or after emulsification of the foam in a mechanical beater. The fibers may be natural or synthetic textile fibers such as superpolyamides or polyesters and they are from 1–2 deniers, 0.1–6 mm. in length and present in an amount between 2 and 20 percent by weight in the plastisol. Imitation leather is produced from these foams by joining two layers thereof together, one layer being of lower density but having a greater quantity of fibers therein per unit weight of the plastisol.

3,637,457

NYLON SPUN BONDED FABRIC-CONCRETE COMPOSITE

Edwin S. Gothard, Cary, and John D. Calfee, Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed June 8, 1970, Ser. No. 44,492
Int. Cl. B28b *23/04*; B32b *13/02, 13/14*
U.S. Cl. 161—140 8 Claims



A high-impact resistant concrete-spun bonded fabric laminae including a layer of concrete and a planar fabric comprised of continuous nylon filaments arranged without apparent order within the plane of the fabric and being autogenously bonded together at a substantial number of touching filament crossover points, the fabric being at least partially embedded and under tension in said concrete.

3,637,458

MICROCELLULAR FOAM SHEET

Robert Guy Parrish, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 664,781, Aug. 31, 1967, now abandoned. This application Dec. 27, 1968, Ser. No. 797,312
Int. Cl. B32b *3/00, 7/00*; B29d *27/00*
U.S. Cl. 161—160 7 Claims

A low-density foam sheet of a high work-to-break value thermoplastic crystalline polymer comprising polyhedral-shaped closed cells having a median diameter of at least 500 microns and a process for its preparation by flash extrusion with reduced bubble nuclei formation.

3,637,459

STRUCTURAL PANEL HAVING FOAM PLASTIC CORE

Hal G. Parish; Albert J. Palfrey, and Eugene R. Moore, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 17, 1970, Ser. No. 20,316
Int. Cl. B32b *3/26, 27/06, 31/04*
U.S. Cl. 161—161 5 Claims

Laminated panels of improved stability and wide utility are obtained by employing a styrene-maleic anhydride

copolymer as a foamed core of the panel. The copolymer is a uniform copolymer of from 85 to 65 weight percent styrene and 15 to 35 weight percent maleic anhydride.

3,637,460

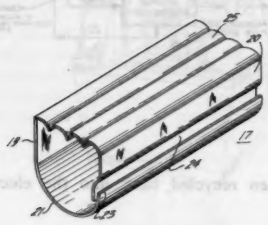
DEWATERING APPARATUS

Peter James Newsom, Centreville, Nova Scotia; William G. Smith, St Johns's, Newfoundland, and Robert Anthony Robinson, New Glasgow, Nova Scotia, all of Canada, assignors to Huyck Corporation, Stamford, Conn.

Filed Aug. 15, 1967, Ser. No. 671,177

Int. Cl. D21f *1/52*

U.S. Cl. 162—352 **6 Claims**



This invention relates to dewatering devices for use in the forming section of papermaking machines. A preferred embodiment comprises an enclosure, the top of which is open to the underside of the forming medium with which it is associated, at least one of the sidewalls of which has a concave lower portion extending into an upturned lip, thereby forming a pocket in which effluent drawn through the forming medium will collect and a second member coextensive with, and having a portion spaced from and within, said concave portion to form a channel that will provide a means for discharging excess effluent from the pocket while keeping the pocket at least partially filled with effluent so as to maintain a seal between the inside of the enclosure and the surrounding air.

3,637,461

PROCESS FOR PRODUCING FATTY ACID ESTERS OF SUGARS

Katsunobu Tanaka, and Takeo Suzuki, both of Machida-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1969, Ser. No. 795,738

Claims priority, application Japan, Feb. 1, 1968, 43/5735

Int. Cl. C12d *13/00*

U.S. Cl. 195—28 R **15 Claims**

A process for producing fatty acid esters of sugars by fermentation which comprises culturing a hydrocarbon-assimilating micro-organism under aerobic conditions in an aqueous nutrient medium containing hydrocarbons as the main source of carbon. Good yields are obtained using n-paraffins of six to 25 carbon atoms or kerosene as the hydrocarbon in the medium. Exemplary micro-organisms are those belonging to the genus *Arthrobacter*, *Brevibacterium*, *Micrococcus*, *Corynebacterium*, *Mycobacterium*, *Candida*, *or Aspergillus*.

3,637,462

PURIFICATION OF ENZYMES

Joseph M. Hill, Dallas, and Robert J. Speer, Richardson, both of Tex., assignors to J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed Apr. 21, 1969, Ser. No. 818,117

Int. Cl. C07g *7/028*

U.S. Cl. 195—66 A **17 Claims**

A therapeutic enzyme such as L-Asparaginase is purified from a protein mixture containing the L-Asparaginase by adding a controlled amount of a buffer solution which will solubilize a major portion of the protein mixture, but only a minor portion of the L-Asparaginase, for example, a sodium acetate buffer solution having a pH in the range of 5.3 to 5.7, and thoroughly mixing the resulting dispersion until the protein is solubilized and a solution is formed containing the enzyme dispersed therein. The enzyme is then separated from the buffer solution by suitable means such as centrifugation. Noxious agents such as endotoxin and pyrogen are removed from the purified or partially purified L-Asparaginase by intimate contact with a water insoluble nonionic sorbent material. Additionally, protectant agents such as Vitamin C can be added to the purified or partially purified L-Asparaginase and thereby cause an increase in the storage life thereof.

3,637,463

PRODUCTION OF OXYTETRACYCLINE USING STREPTOMYCES ALBOFLAVUS (ATCC 15388)

Ivan Villax, Lisbon, Portugal, assignor to International Rectifier Corporation, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 312,877, Oct. 1, 1963, now abandoned. This application Aug. 16, 1967, Ser. No. 660,936

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 **5 Claims**

A fermentative process for the production of oxytetracycline which comprises fermenting a nutrient broth under aerobic conditions at a temperature between 22° and 30° C. by a mutant of *Streptomyces alboflavus* (Waksmann & Curtis), and recovering accumulated oxytetracycline from the fermented broth.

3,637,464

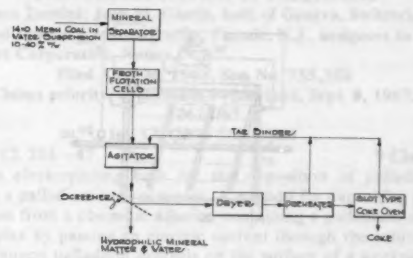
UPGRADING COKING COALS AND COKE PRODUCTION

John H. Walsh, Manotick, Ontario; Basil J. P. Whalley, Ottawa, Ontario, and John C. Botham, Ottawa, Ontario, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Mar. 24, 1969, Ser. No. 810,004

Int. Cl. C10b *47/00, 53/08*

U.S. Cl. 201—6 **9 Claims**



In coke production, coal fines are agglomerated by adding a liquid hydrocarbon to an aqueous dispersion of the fines and agitating the mixture to form spherical agglomerates. These agglomerates are separated, dried, preheated and carbonized.

3,637,465

DISTILLATION METHOD HAVING COUNTERFLOW HEAT EXCHANGE WITH CONDENSATE

James D. Wilson, 902 Marine St., Boulder, Colo.

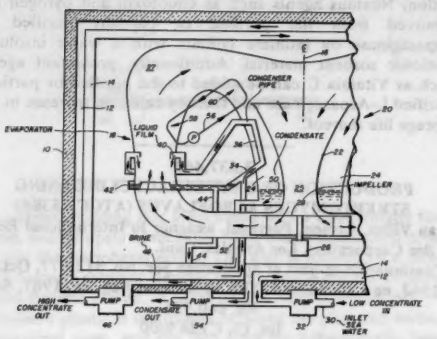
Continuation of application Ser. No. 582,147, Sept. 26, 1966, now abandoned. This application Aug. 6, 1969, Ser. No. 850,325

Int. Cl. B01d *3/00;* **C02b** *1/06*

U.S. Cl. 203—11 **3 Claims**

A distillation method and apparatus which may be used in making potable water from sea water. The input liquid is cir-

culated in a system wherein the heat of evaporation is recovered as the heat of condensation from the condenser is returned to the evaporator. The heat required to bring the



raw liquid to the boiling point is supplied by heat exchange between the leaving condensate and/or concentrate with the entering raw liquid.

3,637,466

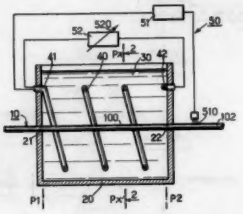
APPARATUS FOR THE ELECTROLYTIC TREATMENT OF WIRES

Rene Fernand Victor Girard, Grenoble, France, assignor to Societe Industrielle Honeywell Bull, Paris, France

Filed May 20, 1968, Ser. No. 730,314

Int. Cl. B01k *3/02*; C23b *5/68*

U.S. Cl. 204—1 R **8 Claims**



The invention concerns apparatus for obtaining an electrolyzing current density which is approximately uniform along a wire subjected to the electrolytic treatment and forming one electrode of the apparatus.

3,637,467

METAL RECLAMATION PROCESS AND APPARATUS

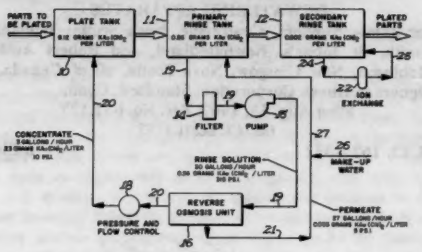
Donald Dean Spatz, Minnetonka, Minn., assignor to Osmonics, Inc., Minneapolis, Minn.

Filed May 7, 1970, Ser. No. 35,472

Int. Cl. C23b *5/00*; B65g *49/00*; B01k *3/00*

U.S. Cl. 204—14 R **11 Claims**

A method of reclaiming metal salts from an electroplating process which utilizes exposing the rinse solution, under pressure, to one side of a semipermeable membrane for separation into a concentrate and a permeate. The concentrate and



permeate are then recycled back into the electroplating system.

3,637,468

ELECTRODES FOR ELECTROLYTIC PROCESSES

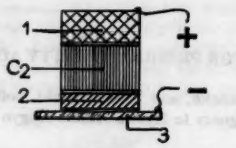
Jean J. G. Icxi, Paris, and Philippe J. Tilche, Clamart, both of France, assignors to Dalic S.A., Paris, France and Le Carbone-Lorraine S.A., Paris, France

Filed Apr. 25, 1969, Ser. No. 819,142

Claims priority, application France, Apr. 29, 1969, 149897

Int. Cl. C23b *5/48, 5/76*

U.S. Cl. 204—15 **7 Claims**



This invention relates to electrolytic electroplating processes and devices. In accordance with the invention, the absorbent material that is conventionally used, for example, in the brush or tampon process, consists of an absorbent porous carbon material. A device for use in this context can comprise an electrode in contact with at least one carbon material member.

3,637,469

ELECTROPLATE HONING METHOD

Myron P. Ellis, Royal Oak, and Richard J. Gavasso, Detroit, both of Mich., assignors to Micromatic Hone Corporation, Detroit, Mich.

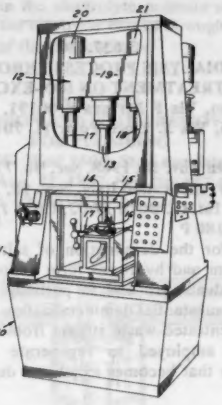
Filed Oct. 6, 1969, Ser. No. 864,086

Int. Cl. C23b *5/56*; B23p *1/00*; B23n *1/02*

U.S. Cl. 204—26 **2 Claims**

An electroplate honing technique that utilizes mechanical abrading or honing to clean the metallic surface of a workpiece, then with the tool acting as an electrode, utilizes an

electroplate honing cycle to plate or deposit metal on the surface of the workpiece, then terminating the flow of current and utilizing a honing cycle to generate the surface finish desired by mechanical abrasion.



3,637,470

PHOSPHORIC ACID PRETREATMENT OF ELECTRODEPOSITABLE WELDED METAL SEAMS

Charles M. Hansen, Monroeville; Joseph A. Muir, Natrona Heights, and Jeffrey R. Leyh, Monroeville, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 23, 1970, Ser. No. 22,042
Int. Cl. C23b 5/62
U.S. Cl. 204—29 23 Claims

This invention relates to a method of eliminating or reducing the number of microbubbles produced when an ionically solubilized electrodepositable composition is electrocoated upon a welded metal seam. The process of the invention comprises treating the welded seam prior to electrocoating with a solution of phosphoric acid.

3,637,471

METHOD OF ELECTRODEPOSITING FERROMAGNETIC ALLOYS

John P. Faulkner, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of application Ser. No. 650,170, June 30, 1967, now abandoned, which is a continuation of application Ser. No. 229,723, Oct. 10, 1962, now abandoned. This application Jan. 29, 1969, Ser. No. 795,054
Int. Cl. C23b 5/32, 5/46
U.S. Cl. 204—43 41 Claims

Deposition of cobalt-phosphorus and cobalt-nickel-phosphorus alloys, on conductive carriers, from an aqueous bath containing the metal ions and at least hypophosphite ions as the source of phosphorus. The deposition is solely the result of electrolysis. The aqueous bath has a pH of from 3.2 to 5.0. The current density is maintained in the range of 10 to 120 amperes per square foot. The products have magnetic properties rendering them valuable for application as high-density digital recording media.

An improvement over the basic process involves the use of both phosphite ions and hypophosphite ions as the source of phosphorus. The phosphite ions decrease the concentration of hypophosphite ions required and increases stability of the electrolyte.

3,637,472

CHEMICAL PLATING BATHS CONTAINING AN ALKALI METAL CYANOBOROHYDRIDE

Edward A. Sullivan, Beverly, and Robert C. Wade, Ipswich, both of Mass., assignors to Ventron Corporation, Beverly, Mass.

Filed Mar. 16, 1970, Ser. No. 20,075
Int. Cl. C23b 5/02; C23c 3/02
U.S. Cl. 204—46 5 Claims

The invention provides an aqueous plating bath comprising an aqueous solution of a cyanoborohydride of lithium, sodium or potassium and a salt of a metal, such as nickel cobalt, chromium, cadmium, copper and silver, and having a pH between about 3 and about 8. Metals and alloys may be chemically deposited in uniform layers from such plating solutions on substrates which have catalytic surfaces. The term "catalytic surface" as used herein refers to the surface of any article which contains, in whole or part, a material which promotes on its surface the reduction of metal ions.

3,637,473

METHOD FOR ELECTROPLATING GOLD

Lawrence Greenspan, New York, N.Y., and Heinrich K. Straschil, East Orange, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Newark, N.J.

Filed July 3, 1969, Ser. No. 839,025
Int. Cl. C23b 5/28; B01k 3/00
U.S. Cl. 204—46 10 Claims

In an improved gold plating process the alkali metal concentration in the bath is maintained substantially constant during the plating operation by contacting the plating bath with an ammoniated cation exchange resin to replace alkali metal ions with ammonium ions and operating the ion exchanged plating bath at 60°–90° C. This process is particularly applicable when heavy coatings are desired, for example, in electroforming processes.

3,637,474

ELECTRODEPOSITION OF PALLADIUM

Franco Zuntini; Jean M. Gloria, both of Geneva, Switzerland, and Donald Gardner Foulke, Passaic, N.J., assignors to Sel-Rex Corporation, Nutley, N.J.

Filed Aug. 26, 1968, Ser. No. 755,386
Claims priority, application Switzerland, Sept. 8, 1967, 12612/67
Int. Cl. C23b 5/24, 5/46
U.S. Cl. 204—47 9 Claims

An electroplating bath for the deposition of palladium from a palladium-urea complex. A method for depositing palladium from a chemical solution containing a palladium-urea complex by passing an electric current through the solution, whereupon palladium deposits on the surface of a workpiece or a cathode.

3,637,475

ZINC-PLATING BATH FOR BRIGHT OR GLOSSY COATING

Tiberiu Bereczky; Ernest Grunwald, both of Cluj, and Ioan Crisan, Bucharest, all of Romania, assignors to Ministerul Industriei Constructiilor de Masini, Bucharest, Romania

Filed Sept. 25, 1968, Ser. No. 762,642
Int. Cl. C23b 5/10, 5/46
U.S. Cl. 204—55 R 2 Claims

An alkaline cyanide-free zinc electroplating bath. The bath contains sodium hexametaphosphate and such gloss-controlling additives as gelatine, furfural and sulphite liquor from cellulose production.

3,637,476

METHOD OF RECOVERING METALS

Michael Pang, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 11, 1969, Ser. No. 856,960
Int. Cl. C22d 1/16
U.S. Cl. 204—106 5 Claims

Copper is recovered from ores, or slags, or tailing piles, in which the cupriferous material is finally subdivided by leaching with a dilute aqueous acidic leach solution, the leach solution separated from insolubles, and the copper extracted using as extractant a long chain alkyl quinaldinic acid, such as 6-dodecylquinaldinic acid, in an organic solvent system, such as 75/25 kerosene/aromatic petroleum fraction and which may contain up to 25 percent of a C_9 to C_{14} alkanol, the organic extractant in solution separated from the aqueous leach solution, and the copper stripped from the organic extractant by strong sulfuric acid, the copper being stripped as copper sulfate in acid solution, from which copper is recovered as electrolytic grade copper by electrolysis.

New quinaldinic acids and methods of synthesis are disclosed.

3,637,477

METHOD OF PREPARING OF CF_3 CHC10CHF_2

Louise S. Croix, Summit, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Continuation of Ser. No. 731,264, May 22, 1968, abandoned.
Filed Feb. 20, 1970, Ser. No. 14,716
Int. Cl. C07c 41/04, 41/12
U.S. Cl. 204—158 HA 4 Claims

Trifluoroethanol, an alkali metal hydroxide, and difluorochloromethane are reacted to prepare 2,2,2-trifluoroethyl difluoromethyl ether which is recovered and chlorinated in the presence of photoenergy to prepare 1-chloro-2,2,2-trifluoroethyl difluoromethyl ether which exhibits excellent anesthetic properties in inhalation susceptible mammals.

3,637,478

PROCESS FOR PRODUCTION OF ALIPHATIC ACIDS

William A. Mueller, and Ronald Swidler, both of Pasadena, Calif., assignors to Armour Industrial Chemical Company, Chicago, Ill.

Filed Apr. 3, 1968, Ser. No. 718,355
Int. Cl. B01j 1/00; C07c 51/00
U.S. Cl. 204—162 18 Claims

Production of aliphatic acids by reaction of terminally unsaturated aliphatic compounds or monocyclic monounsaturated aliphatic compounds with formate ion in the presence of a free radical initiator. The aliphatic acids formed are useful in the production of lubricants, paper coating, rubber compounding or for the formation of derivatives such as soaps, amines and the like.

3,637,479

HALOGENATION PROCESS USING ULTRAVIOLET LIGHT

David D. Rosenberg, Niagara Falls, and David U. Spinney, Grand Island, both of N.Y., assignors to Hooker Chemical Corporation, Niagra Falls, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,387
Int. Cl. B01j 1/10
U.S. Cl. 204—163 R 3 Claims

Liquid cyclopentadiene and chlorine are diluted in a polychlorocyclopentane solvent, reacting to form tetrachlorocyclopentane. The tetrachlorocyclopentane is then passed through an illuminated zone where gaseous chlorine is injected, effecting photochemical chlorination of the organic feed to form a hexachlorocyclopentane product. A portion of the circulating stream leaving the reaction zone is withdrawn as product of the reaction zone, the remainder being recirculated to provide the solvent for the conversion phase of cyclopentadiene and chlorine to tetrachlorocyclopentane.

3,637,480

ELECTRODIALYSIS PROCESS THROUGH SUPPLY WATER PRETREATMENT ON ION-EXCHANGE RESINS

Roberto Passino, Via F Ferrara 8 00191, Roma, and Gianfranco Boari, Via S. Lioco Polar H. 70124, Bari, both of Italy

Filed Nov. 18, 1968, Ser. No. 776,821
Claims priority, application Italy, Nov. 18, 1967, 40817 A/67
Int. Cl. B01d 13/02; C02b 1/82
U.S. Cl. 204—180 P 5 Claims

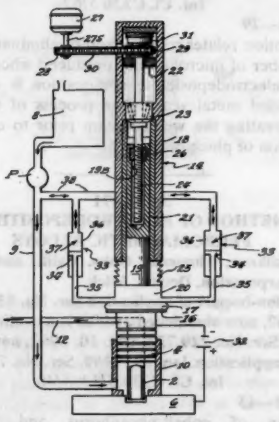
A process for the desalination of salt water employing separate sodium and hydrogen form cation exchange resins to soften, to dealkalize and to partially deionize the said water prior to substantial demineralization by electrodialysis. The salt-concentrated waste stream from the electrodialysis cell may be employed to regenerate the sodium-form exchange resin that becomes exhausted during the softening step.

3,637,481

ELECTROLYTIC DEMETALLIZING APPARATUS HAVING ELECTROLYTE-PRESSURE-RESPONSIVE LOAD-COMPENSATING MEANS

Lynn A. Williams, Winnetka, Ill., assignor to Anocut Engineering Company

Continuation-in-part of application Ser. No. 680,811, Nov. 6, 1967, now abandoned. This application Sept. 24, 1968, Ser. No. 762,077
Int. Cl. B23p 1/02, 1/12
U.S. Cl. 204—224 9 Claims



This application discloses an electrolytic demetallizing apparatus adapted to drive a shaping cathode toward and into a conductive metal workpiece, with a gap that is maintained between the cathode and workpiece being filled by pressurized, rapidly flowing electrolyte through which electric current flows between the cathode and workpiece. The apparatus contains drive means for producing relative movement of the cathode and workpiece at a constant rate along a path that determines the shaping of the workpiece. Also, a hydraulic load-compensating means urges the cathode forward into the workpiece to at least partially counteract the

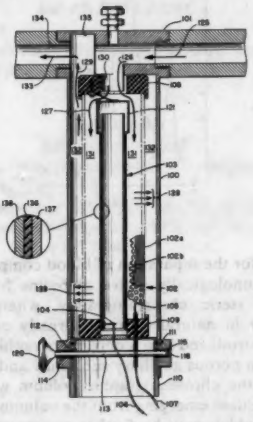
tendency of the electrolyte pressure to produce relative retracting movement between the cathode and the workpiece. The load-compensating means is directly responsive to a change of electrolyte pressure between cathode and workpiece, so that the load-compensating force is relieved upon a sudden decrease in the electrolyte pressure such as may be occasioned when the electrode breaks through the workpiece upon completion of the shaping step.

3,637,482

IONIC CORROSION AND SCALE REMOVAL SYSTEM FOR PLUMBING

Geza L. Vajda, 4561 West 160th St., Lawndale, Calif.

Filed Aug. 22, 1967, Ser. No. 662,413
Int. Cl. B01k 3/00; C22d 1/02
U.S. Cl. 204—228 4 Claims



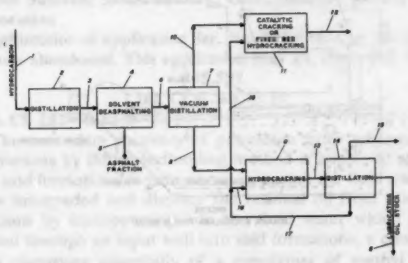
This invention describes a novel scale and corrosion prevention and removal method and means for water systems, wherein alternating current fields are applied to the water at predetermined prime number frequencies to condition the water electrically which results in the breakup of ionic components in the water, usually responsive for corrosion and scale formation, thereby preventing the development of scale or corrosion in the water system plumbing and, in effect, dissolving scale and corrosion which may already be present.

3,637,483

SYNTHETIC LUBRICATING OIL STOCK PRODUCTION

Ralph A. Carey, San Anselmo, Calif., assignor to Ghenron Research Company, San Francisco, Calif.

Filed Nov. 10, 1969, Ser. No. 875,027
Int. Cl. C10g 13/00
U.S. Cl. 208—86 6 Claims



A process for the production of a synthetic lubricating oil, which comprises:

a. Solvent deasphalting a metals-contaminated heavy oil to obtain an asphalt-rich fraction and a raffinate oil of reduced metals content;

b. Vacuum distilling the raffinate oil to obtain at least a light oil fraction and a bottoms fraction;

c. Hydrocracking at least a portion of the bottoms fraction in a hydrocracking zone; and

d. Separating an all-synthetic lubricating oil stock from an effluent stream from the hydrocracking zone.

3,637,484

PLATINUM GROUP METAL ON SILICA-ALUMINA HYDROGENATION CATALYST AND PROCESS

Rowland C. Hansford, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 754,483, Aug. 21, 1968, now abandoned, continuation of Ser. No. 28,115, Apr. 13, 1970. This application June 18, 1970, Ser. No. 47,559
Int. Cl. C10g 23/04; C07c 5/10
U.S. Cl. 208—143 10 Claims

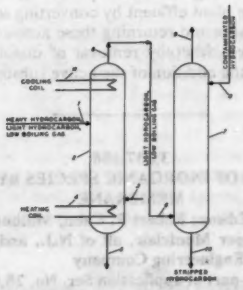
Unsaturated hydrocarbons, particularly aromatic hydrocarbons, are hydrogenated to corresponding saturated hydrocarbons, using a novel, highly active catalyst comprising platinum and/or palladium deposited selectively by cation exchange upon a silica-alumina cogel or copolymer, which in turn is dispersed in a large pore alumina gel matrix.

3,637,485

HYDROCARBON FEED STRIPPING WITH GAS STRIPPED FROM THE REACTOR EFFLUENT

Arnold I. Salka, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 26, 1969, Ser. No. 862,163
Int. Cl. C10g 23/00
U.S. Cl. 208—211 7 Claims



The reactor effluent from a hydroconversion process is (1) passed directly to an effluent stripper, components, hydrogen and light hydrocarbons are stripped by passing a hydrogen-rich gas stream through the stripper in countercurrent flow to said effluent and (3) the hydrogen and light hydrocarbons from the effluent stripper are then passed to a feed stripper to strip oxygen eluant the hydrocarbon feed which is utilized in the hydroconversion process. The invention finds particular utility in hydrodesulfurization.

3,637,486

STEAM DISTILLING PYROLYSIS GASOLINE

Martin P. Grosboll, Homewood, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Mar. 11, 1969, Ser. No. 806,306
Int. Cl. B01d *3/38*; C10g *7/00*
U.S. Cl. 208—363 3 Claims

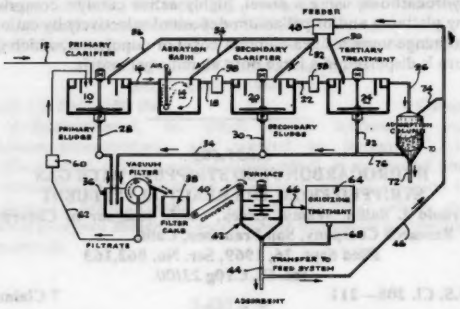
A method of separating dripolene from entrained higher boiling hydrocarbons using a steam stripper is disclosed. The stripper is operated without sufficient preheating of feed, with partial condensation of the steam, and at about 200° to 235° F.

3,637,487

SEWAGE TREATMENT PROCESS

Frank N. Kemmer, La Grange; Reed S. Robertson, Glen Ellyn, and Rodney Mattix, Lemont, all of Ill., assignors to Walco Chemical Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 852,421, Aug. 22, 1969. This application Jan. 11, 1971, Ser. No. 77,046
Int. Cl. C02c *1/06*
U.S. Cl. 210—5 3 Claims



A continuous sewage treatment process for upgrading the quality of sewage plant effluent by converting sewage sludges to active substances and returning these active substances to the sewage system whereby removal of dissolved contaminants occurs by the addition of the active substances.

3,637,488

REMOVAL OF INORGANIC SPECIES BY LIQUID MEMBRANE

Norman N. Li, Edison; Robert P. Cahn, Millburn, and Adam L. Shrier, Upper Montclair, all of N.J., assignors to Esso Research and Engineering Company

Continuation-in-part of application Ser. No. 28,094, Apr. 13, 1970. This application May 12, 1970, Ser. No. 36,686
Int. Cl. B01d *13/00*
U.S. Cl. 210—22 13 Claims

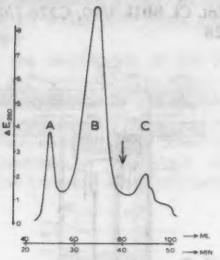
Inorganic species are removed from liquid streams such as waste water streams by treatment with an emulsion of reagent-containing aqueous droplets suspended in an organic liquid containing surfactant which forms a membrane around said aqueous droplets. The inorganic species, such as phosphates in waste water will permeate the membrane; the reagent within the droplet is such that it will react with the permeating inorganic species to form a new compound which will precipitate and remain within the droplets. The emulsion is then removed from the system.

3,637,489

PROCESS FOR THE SEPARATION OF BLOOD COMPONENTS, PARTICULARLY OF IMMUNOLOGICALLY ACTIVE GLOBULINS FROM OTHER COMPONENTS

Wolfgang Haller, 5400 Pooks Hill Road Apt. 912, Bethesda, Md.

Filed Feb. 12, 1970, Ser. No. 10,752
Claims priority, application Germany, Feb. 12, 1969, P 19 07 014.5
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 C 6 Claims



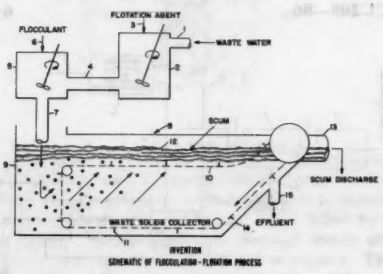
A process for the separation of blood components, particularly of immunologically active globulins from other components, by steric chromatography, whereby plasma or serum, either in natural form or already coarsely prefractionated, is introduced into a chromatographic column which is filled with a porous auxiliary substance and is subsequently eluted from the chromatographic column with an aqueous solvent, the eluant emerging from the column being collected in fractions which may be further concentrated and/or purified. The porous auxiliary substance is a porous glass of a pore diameter of an average value of 100–250 A., said porous glass having been produced by heat treating, particulating, leaching with acid and base of the solidified product of melting together of B_2O_3, SiO_2 and RO, wherein R is an alkali metal, alkaline earth metal or heavy metal.

3,637,490

FLOTATION OF SOLIDS FROM WASTE WATERS

William H. Gardner, and Norval F. Stanley, both of La Vale, Md., assignors to Hercules Incorporated, Wilmington, Del.

Filed July 27, 1970, Ser. No. 58,444
Int. Cl. C02c *1/18*
U.S. Cl. 210—44 6 Claims



In a method for the removal of waste solids from industrial and municipal waste water in flotation apparatus, the im-

provement comprising; blending into the waste water, prior to flotation, a sufficient amount of flotation agent and flocculant to effect rapid flotation of the waste solids from the waste water, passing the blended mixture thus formed into the flotation apparatus, removing the waste solids from the flotation apparatus as scum, and removing the remaining waste water from the flotation apparatus as effluent. Microballoon agents and flocculant polymers are utilized.

3,637,491

CLARIFICATION OF WATER

Ross M. Hedrick, St. Louis, Mo., and David T. Mowry, Yokohama, Japan, assignors to Monsanto Company

Continuation of application Ser. No. 199,659, June 4, 1962, now Patent No. 3,516,932, which is a continuation-in-part of application Ser. No. 230,701, June 8, 1951, now abandoned. This application Nov. 3, 1969, Ser. No. 873,657

Int. Cl. B01d *21/01*

U.S. Cl. 210—54 **23 Claims**

Aqueous suspensions of inorganic particles are clarified by addition of a polyacrylamide.

3,637,492

DRILLING FLUID

Jack H. Kolaian, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Original application Apr. 25, 1967, Ser. No. 633,434. Divided and this application Apr. 27, 1970, Ser. No. 32,355

Int. Cl. C10m *3/14, 3/24*

U.S. Cl. 252—8.5 C **14 Claims**

An aqueous drilling fluid dispersant and a method of drilling wells using said drilling fluid which contains a substituted dihydroxybenzene compound as the dispersant, namely, a substituted dihydroxybenzene compound selected from the group consisting of 2,5-dihydroxy-1,4-benzoquinone, 2,5-dihydroxy-3,6-dichloro-1,4-benzoquinone, 4,5-dihydroxy-1,2-benzoquinone, 4,5-dihydroxy-3,6-dichloro-1,2-benzoquinone and mixtures of said compounds.

3,637,493

DRILLING FLUID

Jack H. Kolaian, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed June 30, 1969, Ser. No. 837,887

Int. Cl. C10m *3/14, 3/22*

U.S. Cl. 252—8.5 C **4 Claims**

A chemically oxidized starch drilling fluid dispersant having improved resistance to deterioration in the presence of bacteria in a low pH mud system by heating a chemically oxidized starch dispersant for 15 to 50 minutes at temperatures of 400°–475° F. and an aqueous drilling fluid containing the heated chemically oxidized starch dispersant.

3,637,494

SECONDARY OIL RECOVERY PROCESS

Frank Sullivan, Santa Barbara, Calif., assignor to GAF Corporation

Continuation of application Ser. No. 545,834, Apr. 28, 1966, now abandoned. This application May 29, 1969, Ser. No. 845,591

Int. Cl. E21b *43/20*

U.S. Cl. 252—8.55 D **4 Claims**

The secondary recovery of petroleum from subterranean formations by the waterflooding method is improved so that the said formations remain pervious, permit the fluid water to flow unimpeded and displace the residual oil from said formations by incorporating into the fluid water which is injected through an input well into said formations, a composition consisting essentially of a copolymer of methyl vinyl ether and maleic anhydride having a specific viscosity of from about 1.3 to 10 and from about 0.2 percent to about 1.5 percent by weight based on the total weight of the composition, of a mixture of inorganic salts consisting of alkali metal chloride, sodium bicarbonate and either calcium or magnesium chloride.

3,637,495

AGENT FOR THE POSTTREATMENT OF LAUNDRY

Hans-Werner Eckert, Dusseldorf, and Arnold Heins, Hilden/Rhld., Germany, assignors to Henkel & Cie GmbH, Postfach, Germany

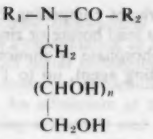
Filed July 26, 1967, Ser. No. 656,136

Claims priority, application Germany, Aug. 1, 1966, H 60124

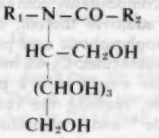
Int. Cl. D06m *13/40;* **C11c** *3/00*

U.S. Cl. 252—8.8 **3 Claims**

A softening agent for the posttreatment of washed laundry is disclosed, the same being adapted for addition to the rinse water either as a solid or in liquid form. The softening agent corresponds to the following formula:



and



wherein R_1 is alkyl containing 10 to 22 carbon atoms, and may be interrupted by ether oxygen atoms in the vicinity of the N atom group, R_2 is alkyl containing seven to 21 carbon atoms and n is either 3 or 4. Preferably the total number of the carbon atoms contained in R_1 and R_2 amounts to at least 23 and preferably amounts to from 27 to 35. The aforesaid softening agents can be employed per se or in combination with other conventional laundry agents such as optical brighteners, acidifiers, disincrusting agents, colorants, perfumes, antimicrobial agents, etc.

3,637,496

PHOSPHINIMINOSULFOXONIUM COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Ted J. Logan, Colerain Township, Hamilton County, Ohio, and Terence W. Rave, Wilmington, Del., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Original application Oct. 25, 1966, Ser. No. 589,208, now Patent No. 3,524,881. Divided and this application Aug. 25, 1969, Ser. No. 852,873

Int. Cl. C07c *145/00;* **D06m** *9/00;* **C11d** *1/00*

U.S. Cl. 252—8.75 **4 Claims**

The phosphiniminosulfoxonium salts and a process for preparing these salts are disclosed. The phosphiniminosulfoxonium salts are useful as emulsifying fabric softening and antibacterial agents.

3,637,497

MOISTURE RESISTANT DRY FILM LUBRICANTS

Vincent G. Fitz Simmons, Great Falls, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 12, 1968, Ser. No. 736,287
Int. Cl. C10m *7/24, 7/06, 7/04*
U.S. Cl. 252—29 2 Claims

Chemical and galvanic corrosion of metallic substrates, by dry film lubricants, is prevented by application over the lubricant surface of a hydrophobic organic polymer coating having a melting point between 100° to 325° C. and a critical surface tension of 31 dynes/cm. or lower.

3,637,498

EXTRUSION LUBRICANT

David W. Sawyer, Oakmont, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 29, 1968, Ser. No. 725,156
Int. Cl. C10m *3/04, 3/02*
U.S. Cl. 252—30 2 Claims

An extrusion lubricant comprising 2.5 to 30 percent graphite, 3 to 9 percent lead borate or zinc oxide, 10 to 15 percent sodium monophosphate or ammonium monophosphate, 1 to 5 percent wetting agent, up to 1 percent microbicide, and balance water.

3,637,499

AMINE DERIVATIVES OF DITHIOPHOSPHORIC ACID COMPOUNDS

Kurt Pollak, Westfield, N.J., assignor to Esso Research and Engineering Company

Original application May 11, 1967, Ser. No. 637,646, now Patent No. 3,546,324. Divided and this application Mar. 16, 1970, Ser. No. 20,082
Int. Cl. C10m *1/48*
U.S. Cl. 252—32.7 R 9 Claims

Lubricating oil compositions containing as antiwear and detergent-inhibitor additives therein, an amine neutralized derivative of a dithiophosphoric acid prepared by reacting a long chain alkenyl-substituted C_3–C_8 monocarboxylic acid of 400–3,000 molecular weight with a primary or secondary hydrocarbylol amine, reacting the resultant amide with a phosphorus sulfide and neutralizing the resultant dithiophosphoric acid with a polyamino compound.

3,637,500

LUBRICATING COMPOSITIONS

Eric Simon Forbes, Woking, and Keith George Allum, Bagshot, both of England, assignors to The British Petroleum Company Limited, London, England

Continuation-in-part of application Ser. No. 700,022, Jan. 24, 1968, now abandoned. This application July 17, 1970, Ser. No. 55,967
Int. Cl. C10m *1/42;* C01m *1/38*
U.S. Cl. 252—48.6 12 Claims

Synthetic ester lubricants and certain organic sulfide load-carrying additives form a synergistic mixture when added to mineral base oils, and there is a marked increase in the load-carrying properties of the base oil.

3,637,501

COMPLEX ESTERS

Robert E. Malec, Birmingham, and Peter A. Immethun, Southfield, both of Mich., assignors to Ethyl Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 773,665, Nov. 5, 1968, now abandoned. This application July 3, 1969, Ser. No. 839,052
Int. Cl. C10m *1/26*
U.S. Cl. 252—57 11 Claims

A complex ester is made by the reaction of a neopentyl-type polyol such as pentaerythritol, trimethylolpropane, or neopentyl glycol; an aromatic polycarboxylic acid such as phthalic, trimellitic, pyromellitic, or mellitic acid, and an aliphatic monocarboxylic acid having from 2–12 carbon atoms, in proportion such that the average number of carbon atoms per acid molecule is from 4–10. The esters have exceptionally low pour points, high viscosity index, and are suitable for lubricating turbine bearings.

3,637,502

METHOD FOR MANUFACTURING GEL

Howard J. Matson, Markham, Ill., and Ira T. Fritz, Atlanta, Ga., assignors to Atlantic Richfield Company, New York, N.Y.

Filed July 11, 1969, Ser. No. 841,122
Int. Cl. C10m *1/16*
U.S. Cl. 252—59 7 Claims

An improved method for manufacturing a foam inhibitor for soluble oils is described. The foam inhibitor is a gel of a mineral oil of lubricating viscosity, about 2 to 10 weight percent of a petroleum microcrystalline wax and about 1 to 10 weight percent of a polymer of ethylene having a molecular weight of about 1,000 to 12,000. A mixture of these components is heated at a temperature sufficient to provide a solution and the heated solution is shock cooled by adding particles of solid carbon dioxide in an amount sufficient to cool the mixture to a temperature below about 120° F. in a time sufficient to yield a gel having low particle size and a high degree of particle distribution of the ethylene polymer and the wax.

3,637,503

LUBRICATING COMPOSITION

Joseph P. Giannetti, Allison Park, and Robert A. Plundo, Greensburg, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 28, 1969, Ser. No. 845,502
Int. Cl. C10m *1/16*
U.S. Cl. 252—59 10 Claims

A lubricating oil composition having good shear stability is obtained by blending together a mineral lubricating oil and a viscosity index improving amount of a polymer of a normal alpha olefin having from four to 16 carbon atoms per molecule. The polymer is obtained by polymerizing the alpha olefin or alpha olefin mixture in the liquid phase in the presence of aluminum chloride and a nonpolymerizing hydrocarbon diluent at a temperature between about −40° and +70° F. for a time sufficient to produce a polymer having a viscosity of about 40 to about 3000 centistokes at 210° F. The alpha olefin is introduced into the polymerization system at a rate of about 0.6 to about 60 moles of olefin per mole of aluminum chloride per hour. The addition of the olefin is continued until 2 to 200 moles of olefin per mole of aluminum chloride has been added.

3,637,504

FERROMAGNETIC STORAGE CORES AND PROCESS OF MAKING THE SAME

Rudolf Schmid, Neu-Germering, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 26, 1968, Ser. No. 762,907
Claims priority, application Germany, Sept. 26, 1967, P 16 71 071.7
Int. Cl. C04b *35/26*
U.S. Cl. 252—62.61 14 Claims

Ferromagnetic storage cores and a process of making the same wherein the cores are composed of 3.5 to 15 mol percent of ZnO, 10 to 16 mol percent of LiO_2 and 70 to 81 mol percent of Fe_2O_3 and exhibit a rectangular hysteresis loop with a R_s of more than 0.7 over a broad operating temperature range without current readjustment. The process comprises presintering the core material in a nitrogen atmosphere, then initially sintering in an oxygen atmosphere, continuing sintering in the oxygen atmosphere at an elevated

temperature, initially cooling the sintered materials and finally cooling the materials to ambient temperatures.

3,637,505

METHOD OF PREPARING A LITHIUM-CONTAINING FERRITE COMPOSITION

Adolph L. Micheli, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 16, 1969, Ser. No. 833,448
Int. Cl. C04b *35/26*
U.S. Cl. 252—62.61 **4 Claims**

Finely divided particles of lithium ferrites are prepared by coprecipitating from aqueous solution a suitable fatty acid salt of lithium (such as, preferably, lithium laurate or lithium stearate) with ferric hydroxide and, when desired, hydroxides of other metals. The finely divided precipitated particles comprising an intimate mixture of ferrite precursor materials are heated to burn out the organic fatty acid material and yield a residue of uniformly mixed metal oxides, which oxides are subsequently calcined to form a desired ferrite.

3,637,506

FERROELECTRIC CERAMIC COMPOSITION

Mikio Tanizake; Yasuo Omori, both of Irumagun, and Jun Sugihara, Kawagoe, all of Japan, assignors to Toko Inc., Tokyo, Japan

Filed June 25, 1970, Ser. No. 49,655
Claims priority, application Japan, June 30, 1970, 44/51374
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 **1 Claim**

The ferroelectric ceramic compositions consist of $PbTiO_3$, $PbZrO_3$ and $Pb(Ni1/5\ Fe1/3\ Nb3/5)O_3$ which are in a hexagonal region defined by points A, B, C, D, E and F in the ternany diagram, the mol percent of these components at these points being

	$PbTiO_3$	$PbZrO_3$	$Pb(Ni\frac{1}{5}Fe\frac{1}{3}Nb\frac{3}{5})O_3$
A	20	0	80
B	0	30	70
C	0	70	30
D	9	90	1
E	70	29	1
F	60	0	40

3,637,507

AIRCRAFT HYDRAULIC FLUID AND METHOD OF CONTROLLING ACID BUILDUP THEREIN WITH ACID ACCEPTOR

William F. Gentit, Mohegan Lake, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Feb. 12, 1968, Ser. No. 704,514
Int. Cl. C09k *3/02;* **C10m** *3/20, 3/40*
U.S. Cl. 252—78 **15 Claims**

An aircraft hydraulic fluid comprising (1) a base stock material selected from the group consisting of esters of an acid of phosphorus, amides of an acid of phosphorus and mixtures thereof, and (2) an acid acceptor consisting of a 3,4-epoxycycloalkyl 3,4-epoxycycloalkyl carboxylate. By incorporating about 0.1 to about 10 percent by weight of said acid acceptor in said hydraulic fluid, acid buildup therein is controlled.

3,637,508

PROCESS AND COMPOSITION FOR DISSOLVING COPPER OXIDE

William B. Willsey, 108 Deerfield Drive, Cherry Hill, N.J., and Daniel J. Brogan, 7111 Penarth Ave., Upper Darby, Pa.

Continuation-in-part of application Ser. No. 601,181, Dec. 12, 1966, now abandoned. This application Mar. 6, 1970, Ser. No. 17,154
Int. Cl. C02b *5/06*
U.S. Cl. 252—87 **17 Claims**

The present invention relates to dissolving copper oxide, whether cuprous or cupric oxide. A polyamine selected from a group consisting of ethylenediamine, diethylenetriamine, triethylenetetramine and tetraethylenepentamine is mixed with a compound selected from a second group consisting of salicyclic acid, metahydroxybenzoic acid, parahydroxybenzoic acid, a dihydroxybenzoic acid, 5—5′-methylenedisalicyclic acid, 3-hydroxy-2-naphthoic acid and salts thereof with an aliphatic polyamine of the first class and with ammonium hydroxide in an alkaline water solution or a salicylate of one of these amines can be used with ammonium hydroxide. The composition can be used cold but will preferably be used in a temperature range between 150° F. and the boiling temperature at the particular pressure.

3,637,509

CHLORINATED MACHINE DISHWASHING COMPOSITION AND PROCESS

William R. Brennan, and Philip M. Sabatelli, both of Cincinnati, Ohio, assignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 10, 1970, Ser. No. 10,292
Int. Cl. C11d *7/56*
U.S. Cl. 252—99 **3 Claims**

A chlorinated machine dishwashing composition is disclosed which includes a combination of an organic chlorinating agent and an alkali metal tripolyphosphate. Particles of the combination are coated or encapsulated with tetrapotassium pyrophosphate. An admixture of the coated combination with a low-foaming surfactant and a defoamer remains stable after long storage periods with respect to retention of both available chlorine and low-foaming characteristics during use even in the presence of proteinaceous substances. Cooking and eating utensils may be cleaned by a low-foaming aqueous solution of the present machine dishwashing composition with less spotting and greater clarity than is generally experienced when using related compositions including chlorinated materials.

3,637,510

ANTISEPTIC DETERGENT COMPOSITION

Moneeb Hassan Zakaria, Chicago, Ill., assignor to Armour-Dial, Inc., Chicago, Ill.

Original application Aug. 18, 1967, Ser. No. 661,521, now Patent No. 3,551,441, dated Dec. 29, 1970. Divided and this application Feb. 2, 1970, Ser. No. 12,501
Int. Cl. C11d *3/48*
U.S. Cl. 252—107 **7 Claims**

The products resulting from the reaction of halogenated aminobenzothiazoles with 3,4-dichlorophenyl isocyanate in a dry inert organic solvent are disclosed. These products have a high degree of activity against bacteria such as S. aurcus 209 and are thus useful as the active ingredients in antiseptic compositions.

3,637,511

DETERGENT FORMULATIONS

Meiling T. Yang, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

Filed May 19, 1969, Ser. No. 825,984
Int. Cl. C11d *3/30*
U.S. Cl. 252—527 **10 Claims**

To obviate eutrophication of water, nonphosphorus detergent builders are provided. These are the water-soluble salts of N,N,-di(carboxymethyl)-aspartic acid (e.g., the tetrasodium salt thereof). Conventional detergent actives may be used with these builders. Synthesis of the builders is described.

3,637,512

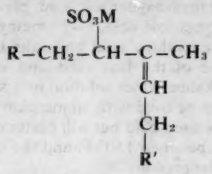
HYDROCARBON SOLVENT COMPOSITION

Ted P. Matson, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed July 22, 1968, Ser. No. 746,321
Int. Cl. C11d *1/12;* **D06l** *1/04*
U.S. Cl. 252—555 **5 Claims**

A hydrocarbon solvent composition having improved foaming characteristics is provided wherein the hydrocarbon

solvent composition consists of a petroleum-derived light hydrocarbon fraction and a foaming agent having the general formula



where R and R′ are selected from H and acrylic hydrocarbon radicals, M is an alkaline earth or an alkali metal, and the total number of carbon atoms in said foaming agent is at least 18.

3,637,513

CLEANSING AGENT COMPOSITION

Alvin F. Schneider, Edison, N.J., assignor to Alpha Metals, Inc., Jersey City, N.J.

Filed Oct. 23, 1969, Ser. No. 868,909
Int. Cl. C09d *9/00;* **C11d** *7/50;* **C23g** *5/02*
U.S. Cl. 252—171 **3 Claims**

A cleansing agent for removing polar and nonpolar soils from electrical packages which is suitably active on both polar and nonpolar soils, is nonflammable, has a narrow boiling range of 113°–121° C., and includes the azeotrope of 2-ethoxyethanol and tetrachloroethylene, with an excess of the latter of approximately 15 to 70 percent by weight.

3,637,514

VICINAL TOLUENEDIAMINE MIXTURES

Sydney M. Spatz, Williamsville; Maurice E. Bailey, Orchard Park, and Francis E. Evans, Hamburg, all of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 20, 1969, Ser. No. 835,257
Int. Cl. C07c *87/48*
U.S. Cl. 252—182 **3 Claims**

Toluenediamine mixtures comprising at least about 96 percent by weight of vicinal toluenediamine isomers and not more than about 4 percent by weight of nonvicinal isomers, said mixtures being adapted for conversion to bz-methyl-1-H-benzotriazoles in high yields.

3,637,515

TELLURIUM DIOXIDE SOLUTIONS

Juan Luis Huguet, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Original application May 2, 1966, Ser. No. 546,618, now Patent No. 3,479,395. Divided and this application Apr. 23, 1969, Ser. No. 841,647
Int. Cl. C01b *19/00*
U.S. Cl. 252—182 **5 Claims**

Solutions of tellurium dioxide, suitable for employment as reaction medium in tellurium dioxide oxidations of suitable organic compounds such as olefins, are prepared by introducing tellurium dioxide and a source of halide ion into a liquid which comprises a solvent for the halide ion source.

3,637,516

ALKALI METAL CYANOBOROHYDRIDE REDUCTIVE BLEACHING LIQUOR

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

Filed Aug. 19, 1969, Ser. No. 851,472
Int. Cl. D21c *9/10;* **D06l** *3/10*
U.S. Cl. 252—188 **6 Claims**

The invention provides an aqueous reductive bleaching liquor containing the material to be bleached selected from groundwood pulp, kraft pulp, chemigroundwood pulp and clay dispersed therein in conventional amounts. As the reducing agent, a cyanoborohydride is dissolved in the liquor in an amount between about 0.01 and about 0.3 percent based upon the dry weight of the selected material to be bleached. The liquor has a pH between about 3 and 6 and is stable at a temperature between room temperature and about 180° F. The cyanoborohydride is selected from lithium, potassium, and sodium cyanoborohydride, sodium cyanoborohydride being preferred.

3,637,517

PROCESS FOR PRODUCING PHOSPHORS

James E. Mathers, Ulster, and Felix F. Mikus, Towanda, both of Pa., assignors to Sylvania Electric Products Inc.

Filed Jan. 15, 1970, Ser. No. 3,236
Int. Cl. C09k *1/10, 1/14*
U.S. Cl. 252—301.4 R **6 Claims**

A process for producing an ultrapure rare earth oxide phosphor from partially purified raw materials is disclosed that comprises forming an acidic aqueous solution comprising water, a mineral acid, europium and a second rare earth element selected from the group consisting of yttrium, gadolinium and mixtures thereof having a relatively minute amount of an impurity selected from the group consisting of cerium, thorium and mixtures thereof, maintaining the solution under controlled pH and temperature condition, adding to the solution a controlled amount of a water-soluble persulfate source to thereby form a solid and liquid phase, separating the phases and adding oxalic acid to the liquid phase to form a rare earth oxalate and converting the oxalate to the corresponding rare earth phosphor selected from the group consisting of rare earth oxides and rare earth oxysulfides.

3,637,518

PHOSPHOR FOR THERMOLUMINESCENT RADIATION DOSIMETER

Naohiro Nada, Nishinomiya-shi, and Tadaoki Yamashita, Hirakata-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 1, 1968, Ser. No. 709,739
Claims priority, application Japan, Oct. 12, 1967, 42/66211; 42/66212; Feb. 9, 1968, 43/8656
Int. Cl. C09k *1/10*
U.S. Cl. 252—301.4 R **9 Claims**

A phosphor for a thermoluminescent radiation dosimeter, which is composed primarily of beryllium oxide doped with at least one activator selected from the group consisting of lithium, sodium, potassium, silicon, germanium, tin, zinc, cadmium, aluminum, thallium, cadmium and ytterbium, and which is especially adapted for measuring the dose absorbed by a tissue as its effective atomic number is approximately the same as that of the tissue, and has an excellent sensitivity and retention of radiation energy absorbed.

3,637,519

METHOD FOR THERMALLY REFINING PRECIPITATED HALOAPATITES

Roger D. Piper, Des Peres, Mo., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed July 22, 1969, Ser. No. 843,462
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.4 P **4 Claims**

Precipitated alkaline earth haloapatites containing antimony as an activator are thermally refined by heating them first to a temperature of at least 800° C. in an oxidizing atmosphere to remove ammonia and water without reducing the antimony. Thereafter, the haloapatites may be further thermally refined by being heated at 1,050°–1,200° C. in an inert atmosphere to complete the refining treatment. This method avoids loss of antimony and other activators and produces a significantly brighter phosphor product.

3,637,520

SOLVENT-SOLUBLE QUATERNARY AMMONIUM SALTS OF CELLULOSE SULFATE

Richard G. Schweiger, Muscatine, Iowa, assignor to Kelso Company, San Diego, Calif.

Continuation-in-part of application Ser. No. 772,814, Nov. 1, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 615,337, Feb. 13, 1967, now abandoned. This application Sept. 25, 1969, Ser. No. 861,156

Int. Cl. C08b *5/14*

U.S. Cl. 252—316 **51 Claims**

Quaternary ammonium salts of a colloidal cellulose sulfate having a degree of substitution of at least about two and method of making by adding a water-soluble salt of the colloidal cellulose sulfate to water, then adding a quaternary ammonium salt and optionally a lower alcohol. The resulting products are soluble in many organic solvents.

As described in my prior U.S. Pat. application Ser. No. 467,738, the essentially undegraded cellulose sulfate employed as a reactant according to the present invention has a viscosity in a 1 percent aqueous solution in excess of 20 cps. and preferably in excess of 100 cps. as measured with a Brookfield Synchro Electric Viscometer Model LVF at 60 r.p.m. and 25° C., and a number of these cellulose sulfates have a viscosity in a 1 percent aqueous solution in excess of 100 cps. The cellulose sulfates employed as reactants according to the present invention and as described in U.S. application Ser. No. 467,738 are further characterized by their reactivity with potassium ions in aqueous media to form a thermoreversible gel.

3,637,521

DEMULSIFICATION OF SULFONATED OIL EMULSIONS

Andrew G. Tsuk, Laurel, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed June 26, 1969, Ser. No. 836,979

Int. Cl. B01d *17/00*

U.S. Cl. 252—326 **14 Claims**

Sulfonated oil emulsions are readily demulsified by contact with an alkyl amine and an acid. Such emulsions comprise cutting oils, and sulfonated petroleum fractions. The alkyl amines contain from one to five amine groups and from two to 12 carbon atoms.

3,637,522

PROCESS AND APPARATUS FOR TREATING OIL EMULSIONS

Noble E. Young, Box 383, Geismar, La.

Continuation-in-part of application Ser. No. 330,811, Dec. 16, 1963, now abandoned. This application July 16, 1968, Ser. No. 745,181

Int. Cl. B01d *17/04*

U.S. Cl. 252—328 **11 Claims**

An oil-water-solid particles emulsion is separated by heating the emulsion to its critical separation temperature, thoroughly mixing and washing the heated oil with salt water to coagulate the emulsion water and solid particles into larger globules, increase the specific gravity of the globules and make the mixture homogeneous, then establishing vibratory waves in the mixture to accelerate separation of the mixture by gravity. Batch and continuous flow systems for carrying out the process, including a steam-operated jet pump injection system, are also disclosed.

3,637,523

ESTERS OF GLYCEROL AND POLYHYDRIC ALCOHOL COPOLYMERS USEFUL AS EMULSIFYING AGENTS AND PROCESS FOR THEIR PRODUCTION

James Harwood, Chicago, Ill., assignor to SCM Corporation, Cleveland, Ohio

Filed Sept. 12, 1968, Ser. No. 759,496

Int. Cl. B01f *17/34*

U.S. Cl. 252—356 **8 Claims**

This invention relates to a class of emulsifying agents which have been found to be particularly useful in food and bakery products. Basically, the emulsifying agents are esters of a copolymer of glycerin and a polyhydric alcohol other than glycerin. The polyhydric alcohol employed can have from two to six carbon atoms in the molecular structure. The mole ratio of glycerin to polyhydric alcohol is from about 0.1:1 to 10:1. The esters are produced generally by reacting the copolymer with a carboxylic acid or carboxylic acid radical donating compound which has from eight to 22 carbon atoms and, preferably, the acid radical donated is a fatty acid radical.

3,637,524

HALIDE ADDITION AND DISTRIBUTION IN THE REACTIVATION OF PLATINUM GROUP CATALYSTS

Marvin F. L. Johnson, Homewood, and Stuart L. Graff, Calumet City, both of Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed July 11, 1968, Ser. No. 743,924

Int. Cl. B01j *11/18, 11/80*

U.S. Cl. 252—415 **10 Claims**

There is disclosed a method for reactivating a fixed bed of used platinum group metal-alumina catalyst of the type in which the alumina is derived from hydrous alumina predominating in alumina trihydrate. Such catalysts are employed in, for instance, the catalytic reforming of gasoline boiling range hydrocarbons to obtain fuels of high-octane ratings or aromatics. The method for reactivating the catalyst which has declined in activity during use and contains carbonaceous deposits, involves treating the deactivated catalyst at elevated temperatures with an oxygen-containing gas to burn the carbonaceous deposits therefrom. The relatively carbon-free catalyst is contacted under controlled conditions with a gaseous stream containing small amounts of chlorine, in combined or elemental form, oxygen and often water vapor to deposit chloride in a first portion of the catalyst bed. After the chlorine component is added to the catalyst, preferably in a relatively short period of time, the catalyst is then contacted with a gaseous stream containing oxygen and water vapor. This treatment may continue for a longer time than the chlorine treating period and until the chloride deposited on the catalyst is distributed through a major portion of the catalyst bed. Distribution of the chloride is a function of the time, temperature and water vapor partial pressure observed during the treatment and thus the distribution is controlled essentially by kinetics. The extent of water contact with the catalyst is limited by controlling the amount of water in the gaseous streams and the length of the overall treatment.

3,637,525

CATALYST AND METHOD OF PREPARATION

Mark J. O'Hara, Prospect Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 21, 1969, Ser. No. 878,908. The portion of the term of the patent subsequent to Apr. 21, 1987, has been disclaimed.

Int. Cl. B01j *11/82*

U.S. Cl. 252—432 **16 Claims**

A method of manufacturing an extruded catalyst composite of a Group VIII metal, a Group VIB metal and a refractory inorganic oxide-boron phosphate carrier material. A refractory inorganic oxide hydrogel is prepared and formed into a slurry with an aqueous solution of boric and phosphoric acids. The liquid level of the slurry is adjusted to form an extrudable mass comprising from about 15 to about 45 weight percent solids. The material is then extruded, impregnated with a metal of Group VIII and a metal of Group VIB, dried and calcined in an oxidizing atmosphere.

3,637,526

PREPARATION OF OXIDATION CATALYST

Leon B. Levy, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,305
Int. Cl. B01j *11/74*
U.S. Cl. 252—439 10 Claims

Disclosed herein is a process for preparing an oxidation catalyst containing molybdenum, tungsten, tellurium, and oxygen, which catalyst has particular utility for the oxidation of propylene to acrolein. A preferred embodiment comprises forming an aqueous solution of ammonium paratungstate and ammonium molybdate, evaporating the liquid from the solution, pulverizing the solid, and then calcining at a temperature of about 400° C. The calcinate is then mixed with tellurium dioxide and the admixture is calcined. This procedure gives longer catalyst life for the oxidation of propylene to acrolein.

3,637,527

PREPARATION OF MULTICOMPONENT CATALYSTS

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 756,396, Aug. 30, 1968, now Patent No. 3,523,912, which is a continuation-in-part of application Ser. No. 568,760, July 29, 1966, now Patent No. 3,401,125, which is a continuation-in-part of application Ser. No. 369,583, May 22, 1964, now Patent No. 3,280,040. This application July 23, 1969, Ser. No. 844,194
The portion of the term of this patent subsequent to Oct. 18, 1983, has been disclaimed.
Int. Cl. B01j *11/78*
U.S. Cl. 252—441 6 Claims

Method of producing a multicomponent hydrocarbon conversion catalyst comprising coprecipitating a mixture of at least three different metal compounds at a pH of 5.5 to 8, at least one of said compounds being a compound of palladium, at least one of said compounds being a metal chloride, reducing the chloride content of the coprecipitate to below about 0.25 percent of the total weight thereof, drying the coprecipitate, and heat treating the dried coprecipitate by contact with an oxygen-containing gas at 850° to 1,600° F. for 0.25 to 48 hours.

3,637,528

LOW TEMPERATURE-SHIFT CATALYST

Alvin B. Stiles, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 688,407, Dec. 6, 1967. This application Aug. 26, 1969, Ser. No. 853,201
Int. Cl. B01j *11/58, 11/32*
U.S. Cl. 252—454 2 Claims

A reduced zinc oxide-copper oxide low-temperature shift catalyst is prepared that contains colloidal silica and diatomaceous earth. The resulting catalyst has improved pore, density and strength characteristics.

3,637,529

PROCESS FOR PREPARING SUPPORTED CATALYSTS

Wilhelmus Petrus Van Beek, and Theo Jan Osinga, both of Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 6, 1970, Ser. No. 26,099
Claims priority, application Luxembourg, Apr. 9, 1969, 58,392
Int. Cl. B01j *11/24*
U.S. Cl. 252—459 5 Claims

A process for preparing a catalyst comprising a metallic catalytic agent on a particulate carrier is disclosed which provides improved uniformity of distribution and fineness of division with narrowness of particle size distribution of the metallic catalytic agent on the carrier. The carrier is impregnated with an aqueous solution of a salt of the metallic catalytic agent and of a source, on heating in aqueous solution, of hydroxyl ions. The impregnated carrier is heated without substantial loss by evaporation of the aqueous solution to precipitate the metal or the particles with uniformity of distribution and fineness of division with narrowness of particle size distribution. The metal is converted by conventional methods to the appropriate active, oxidized or reduced, state. The process is particularly significant with carriers, such as alumina and silica, that in alkaline media are liable to undergo structural charges.

3,637,530

RESISTOR COMPOSITION

Mira E. A. Casale; Owen N. Collier, and Gerald S. Iles, all of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Continuation-in-part of application Ser. No. 675,786, , now abandoned. This application Feb. 10, 1970, Ser. No. 9,995
Int. Cl. H01b *1/06;* B44c *1/18*
U.S. Cl. 252—518 8 Claims

A resistor composition in the form of an oxide containing niobium and ruthenium in which the atomic ratio of metal to oxygen is 1:2 and in which the atomic ratio of niobium to ruthenium is within the range of 1:2000 to 1:1.

3,637,531

METHOD FOR MAKING CERAMIC TITANATE ELEMENTS AND MATERIALS THEREFOR

Robert C. Faxon, Attleboro, Mass., and Robert T. McGovern, Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of application Ser. No. 651,992, July 10, 1967, now abandoned. This application May 1, 1970, Ser. No. 33,962
Int. Cl. H01b *1/06*
U.S. Cl. 252—520 26 Claims

A method for making ceramic titanate elements and materials therefor, particularly semiconducting lanthanide-doped barium titanate elements having positive temperature coefficients of resistance for use as solid-state sensors or the like, is shown to comprise the steps of dissolving the titanium chelate of triethanolamine with selected alkaline earth salts such as barium acetate and with selected lanthanide salts such as lanthanum acetate in a solvent to form a common solution. Alternatively, tetraisopropyl titanate mixed with lactic acid is combined with selected alkaline earth salts such as barium acetate and with selected lanthanide salts such as lanthanum acetate in a solvent to form a common solution. The solution is then heated, initially to form a semisolid material and thereafter—in an oxidizing or neutral atmosphere—to calcine the semisolid material to form the desired titanate material. The resulting titanate material is then combined with a binder, is pressed into a desired shape, and is fired at high temperature to form the desired ceramic titanate elements.

3,637,532

SINTERED COLD-CONDUCTOR RESISTOR BODY AND METHOD FOR ITS PRODUCTION

Emil Ramisch, and Werner Schwan, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of application Ser. No. 485,238, Sept. 7, 1965, now abandoned. This application Aug. 1, 1969, Ser. No. 852,147
Int. Cl. H01b *1/06*
U.S. Cl. 252—520 12 Claims

Positive temperature coefficient resistor materials composed of doped ferroelectric substances such as barium titanate, the materials including at least two discrete crystalline phases, one composed of a material having a Curie temperature above and the other composed of a material having

a Curie temperature below the Curie temperature of the composite, the composite having a substantially improved load quotient.

3,637,533

PERFUME-CONTAINING COMPOSITIONS CONTAINING CERTAIN OXIMES AS OLFACTORY AGENTS

Robert T. Dahill, Jr., Perth Amboy, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Filed Feb. 14, 1967, Ser. No. 617,761
Int. Cl. A61k *7/00*; C11b *9/00*
U.S. Cl. 252—522 13 Claims

The use of certain oximes as olfactory agents in perfume compositions is described. The oximes are those of seven to 10 carbon atom aliphatic aldehydes and Ketones, excluding oximes of saturated, straight-chain aldehydes. Numerous examples showing the use of the oximes in various perfume compositions are given, as well as examples showing the preparation and identifying properties of the following 3 novel oximes: 3,7-dimethyloctanal oxime; 2,6-dimethyl-5-heptenal oxime and 3-methylheptan-5-one oxime.

3,637,534

POLYMERS FROM AROMATIC PRIMARY DIAMINES

Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation of application Ser. No. 629,354, Apr. 10, 1967, now abandoned , Continuation-in-part of application Ser. No. 491,828, Sept. 30, 1965, now abandoned. This application July 9, 1969, Ser. No. 840,452
Int. Cl. C08g *33/02*
U.S. Cl. 260—2 R 14 Claims

Aromatic primary diamines are polymerized by an oxidative solution polymerization reaction using a cupric-cuprous redox couple complexed with a nitrogen base to give ordered polymers containing the azo linkage.

3,637,535

ANION EXCHANGER WITH SPONGE STRUCTURE

Herbert Corte, Leverkusen, and Alfred Meyer, Cologne-Stamheim, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 4, 1958, Ser. No. 718,989
Claims priority, application Germany, Mar. 9, 1957, F 22532
Int. Cl. C08j *1/34*
U.S. Cl. 260—2.1 15 Claims

1. A process which comprises (a) dissolving a major amount of styrene and a minor amount of divinyl benzene in an inert organic liquid which is a solvent for styrene but not for linear polystyrene, said inert organic liquid being selected from the group consisting of an inert aliphatic oxygen-containing solvent and an inert aliphatic hydrocarbon solvent, said solvent being present in an amount sufficient to impart a spongelike porosity to the copolymer formed therein; (b) incorporating said solution into an excess of water to form a dispersion of droplets; and (c) copolymerizing said styrene and said divinyl benzene while suspended in said aqueous medium and in the presence of said inert organic liquid, the resulting copolymer being recovered in the form of opaque resin beads.

3. A method for producing anion-exchange resins which comprises haloalkylating and aminating the product formed in the process of claim 2.

3,637,536

HIGHLY ELASTIC POLYURETHANE FOAMS BASED ON A QUASI-PREPOLYMER OF TWO DIISOCYANATES

Hans-Georg Ring, 2844 Lemforde, Hagewederstrasse 304, and Jurgen Scheffler, 2844 Quernheim, Lemforde, both of Germany

Continuation of application Ser. No. 677,013, Oct. 23, 1967, now abandoned. This application May 28, 1970, Ser. No. 41,725
Int. Cl. C08q *22/46, 22/06*
U.S. Cl. 260—2.5 AT 3 Claims

Process for the manufacture of highly elastic polyurethane foams which comprises reacting (a) a mixture comprising a polyfunctional polyether glycol having a mean molecular weight between about 3,000 and 5,500, water and catalysts with (b) a quasi-prepolymer mixture of polyether polyols enriched with at least two different organic polyisocyanates. Also included is a further process whereby the mixtures are foamed in a mold at about room temperature or slightly higher.

3,637,537

PHOSPHORUS-CONTAINING NON-INFLAMMABLE POLYURETHANE FOAMS

Michel Buisson, Lavera, Gérard Repiquet, Martigues, and Camille Granger, Lavera, France, assignors to Naphtachimie, Paris, France

No Drawing. Filed Oct. 3, 1967, Ser. No. 672,430
Claims priority, application France, Oct. 25, 1966, 81,499
Int. Cl. C08g *22/44, 23/10*
U.S. Cl. 260—2.5 AR 13 Claims

Non-inflammable polyurethanes having improved physical and chemical properties prepared by the reaction of a chlorochloroalkyl-phosphate with a primary or secondary amine in the presence of excess propylene oxide, separating lower boiling compounds from the reaction product and then reacting the reaction product with an organic polyisocyanate alone or in combination with an organic polyhydroxylated compound which does not contain phosphorus to produce a polyurethane.

3,637,538

FOAMABLE STYRENE POLYMER RESINS

Charles Robert Heald, Newport, England, assignor to Monsanto Chemicals Limited, London, England

No Drawing. Filed June 13, 1968, Ser. No. 736,567
Claims priority, application Great Britain, July 7, 1967, 31,349/67
Int. Cl. C08f *33/02, 47/10*
U.S. Cl. 260—2.5 B 8 Claims

Foamable resin particles comprising a monovinylidene aromatic polymer, a volatile blowing agent, and an amide having a melting point in the range of 35–115° C. and corresponding to the general formula RCONHR′ wherein R is an aliphatic hydrocarbon radical containing 10–24 carbon atoms and R′ is hydrogen or an alkyl radical containing 1–3 carbon atoms; and processes for preparing foamed articles by steam-heating the foamable resin particles to form a prefoam and subsequently treating the prefoam with steam in a mold.

3,637,539

POLYURETHANES PREPARED FROM GLYCERIDE REACTION PRODUCTS

Per Wolff, Farum, and Hans-Ole Larsen, Bagsvaerd, Denmark, assignors to Per Wolff and Henning Kaaber, Farum, Denmark, and H. C. Anderson, Bellavista, Switzerland

No Drawing. Filed Oct. 4, 1968, Ser. No. 765,027

Claims priority, application Great Britain, Oct. 12, 1967, 46,671/67; Feb. 20, 1968, 8,268/68

Int. Cl. C08c *17/08;* C08d *13/08;* C08f *47/10*
U.S. Cl. 260—2.5 5 Claims

A new group of polyurethanes are described and claimed together with methods for their production, the said polyurethanes being the reaction products of a polyisocyanate with a polyol component, of which latter a substantial part is a reaction mixture of hydrocarbon fatty acid glyceride with dialkanolamine, in which at least about half of the fatty acid has been converted into alkanolamide.

3,637,540

POLYURETHANES FROM FATTY ACIDS AND THEIR PRODUCTION

Per Wolff, Rugmarken, and Hans-Ole Larsen, Mollemarken, Denmark, assignors to Per Wolff and Henning Kaaber, both of Rugmarken, Farum, Denmark, and H. C. Anderson, Bellavista, Switzerland

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,641

Claims priority, application Great Britain, Oct. 12, 1967, 46,671/67; Feb. 20, 1968, 8,268/68

Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 AM 6 Claims

A new group of polyurethanes are described and claimed together with methods for their production, the said polyurethanes resulting from the reaction between a polyisocyanate and a polyol component, a substantial part of which is a reaction mixture of hydrocarbon fatty acid or a lower alkyl ester thereof with dialkanolamine, in which at least about half of the fatty acid has been converted into alkanolamide, and the polyol component contains at least about 25% of monomeric fatty acid radicals.

3,637,541

PROCESS FOR PRODUCING POLYETHER-URETHANE FOAM EMPLOYING POLYOXYALKYLENE-POLYSILOXANE BLOCK POLYMERS AS SURFACTANTS

Gerd Rossmy, Essen-Werden, Germany, assignor to Th. Goldschmidt A.-G., Essen, Germany

No Drawing. Filed Feb. 20, 1969, Ser. No. 801,153

Claims priority, application Germany, Mar. 16, 1968, P 16 94 366.1

Int. Cl. C07f *7/08;* C08g *22/46, 53/08*
U.S. Cl. 260—2.5 AH 8 Claims

In a foaming process for producing polyurethane foam in which the foaming is performed in the presence of polyoxyalkylene-polysiloxane mixed block polymers, the invention proposes that the polyoxyalkylene block should consist of two separate moieties, of which the first constitutes about 25–70% by weight and has an average molecular weight of about 1600–4000, 20–100% by weight of the block being constituted by ethylene oxide. The second polyoxyalkylene moiety constitutes 30–75% by weight of the block and has an average molecular weight of 400–1200, the ethylene oxide content of the block being between about 65–100% by weight.

3,637,542

URETHANE FOAMS WITH REDUCED SMOKE LEVELS

Herman P. Doerge, Verona, and Marco Wismer, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,596
Int. Cl. C08g *22/44, 51/58*
U.S. Cl. 260—2.5 AJ 20 Claims

This invention relates to fire-retardant polyurethane foams having reduced smoke levels. The invention comprises incorporating adipic acid into a fire-retardant foam formulation.

3,637,543

FIRE RESISTANT POLYURETHANE FOAMS FROM POLYISOCYANATES, POLYOLS, AND CARBOXYLIC ACID DERIVATIVES

Stanley T. Kus, Griffith, and Fred W. Koenig, Highland, Ind., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of applications Ser. No. 420,500, Dec. 23, 1964, Ser. No. 420,774, Dec. 23, 1964, Ser. No. 448,253, Apr. 15, 1965, and Ser. No. 691,729, Dec. 19, 1967, all now abandoned. This application Nov. 12, 1969, Ser. No. 876,060
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 AJ 23 Claims

Novel thermally stable resins and foams are prepared by reacting without the addition of external heat or pressure a polyfunctional aromatic carboxylic acid derivative comprising a benzene nucleus substituted by members selected from the group consisting of anhydride, carboxyl, or acyl halide with a polyarylpolyisocyanate and a polyol containing at least three hydroxyl groups. The products of this invention are useful for insulation of walls, for fire-proofing buildings and the like.

3,637,544

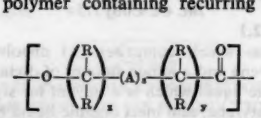
VULCANIZED ELASTOMERIC BLENDS CONTAINING A CYCLIC ESTER POLYMER

Robert Dean Lundberg, Somerville, N.J., and Joseph Victor Koleske and Earl Richard Walter, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,335
Int. Cl. C08c *9/16;* C08d *9/08*
U.S. Cl. 260—3 10 Claims

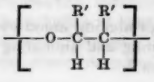
Vulcanizable elastomeric blends having improved processability, additive acceptance, improved strengths in the vulcanized form, improved creep resistance in the unvulcanized form, improved handling and forming characteristics in the unvulcanized form and/or improved stiffness, or in some cases improved flexibility, in the uncured and cured forms, containing a vulcanizable rubber gumstock having substantial, residual, ethylenic unsaturation and a cyclic ester polymer containing recurring units of the formula:

(I)



wherein each R, individually, is selected from the class consisting of hydrogen, alkyl, halo, and alkoxy; A is the oxy group; x is an integer from 1 to 4; y is an integer from 1 to 4; z is an integer of zero or one; with the provisos that (a) the sum of $x+y+z$ is at least 4 and not greater than 7, and (b) the total number of R variables which are substituents other than hydrogen does not exceed 3, and up to a minor molar amount of recurring units of the formula:

(II)



wherein each R' is selected from the class consisting of, individually, hydrogen, alkyl, cycloalkyl, aryl, and chloroalkyl, and, together with the ethylene moiety of the oxyethylene chain of Unit II, a saturated cycloaliphatic hydrocarbon ring having 4 to 8 carbon atoms, and vulcanizables thereof.

These novel vulcanizable elastomeric compositions are useful in the production of molded articles of a variety of shapes and forms as, for example, films, wire and cable coatings, articles of manufacture, and the like, and can be vulcanized or thermoset in such shapes and forms.

3,637,545

PROCESS OF PREPARING METHYL METHACRYLATE POLYMERS

Ernest Fivel, Lyon, France, assignor to Plastugil (Plastiques et Elastomeres Ugine-Progil), Paris, France

Filed Jan. 3, 1969, Ser. No. 788,797

Claims priority, application France, Jan. 19, 1968, 136,319

Int. Cl. C08f *3/68, 15/18*

U.S. Cl. 260—4 **8 Claims**

Polymers of methyl methacrylate, optionally containing a minor proportion of modifying agent, are prepared by continuous mass polymerization in the presence of an initiator and a molecular weight regulator, the reaction mixture being passed in a lamellar flow between diathermic walls at a constant temperature of 145–165° C. and polymerized to a conversion rate of 40–60%. The mixture thus obtained is flash devolatilized above 200° C. to recover the polymer.

3,637,546

THERMOSETTING ACRYLIC ENAMEL CONTAINING CELLULOSE ACETATE BUTYRATE

Fred W. Parker, Flint, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 780,190, Nov. 29, 1968. This application Oct. 16, 1970, Ser. No. 81,630

Int. Cl. C03c *7/02;* **C08b** *21/08*

U.S. Cl. 260—15 **14 Claims**

A coating composition in which the film-forming polymeric material consists essentially of:

(1) an acrylic polymer of styrene, methyl methacrylate, a soft constituent, such as an alkyl acrylate or an alkyl methacrylate other than methyl methacrylate, a hydroxy containing constituent which is either a hydroxy alkyl acrylate or a hydroxy alkyl methacrylate, and an α,β-unsaturated monocarboxylic acid;

(2) cellulose acetate butyrate; and

(3) a thermosetting nitrogen containing resin.

The novel coating composition is particularly useful as a high quality finish on automobiles and trucks.

3,637,547

PHENOL-ALDEHYDE RESIN ADHESIVE COMPOSITION

George Otto Orth, Jr., Seattle, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

No Drawing. Original application Nov. 7, 1966, Ser. No. 592,322, now Patent No. 3,522,128. Divided and this application Jan. 28, 1970, Ser. No. 6,556

Int. Cl. C08g *51/06, 51/18*

U.S. Cl. 260—17.2 **4 Claims**

A phenol-aldehyde resin adhesive containing from 5 to 50 weight percent of a colloidal attapulgus or sepiolite clay.

3,637,548

MELAMINE MOLDING COMPOSITION

Norman W. Standish, Shaker Heights, and Richard W. Yanik, North Randall, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

No Drawing. Filed Apr. 24, 1970, Ser. No. 31,734

Int. Cl. C08g *51/18*

U.S. Cl. 260—17.3 **10 Claims**

A process for producing an improved melamine-formaldehyde molding composition and molded articles therefrom comprises incorporating into the standard melamine-formaldehyde "popcorn" or molding powder from about 1 to 50 percent by weight of a cured, pulverized melamine-formaldehyde polymer composition based on the total weight of the molding powder formulation.

3,637,549

POLYOL/LACTAM/SYNTHETIC RESIN MODIFIED UREA-FORMALDEHYDE RESINS

Michael Edgar Hall, Warrington, and Malcolm Negus, Prescot, near Liverpool, England, assignors to Fibreglass Limited, Liverpool, England

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,725

Claims priority, application Great Britain, Sept. 12, 1968, 43,430/68

Int. Cl. C08g *9/10, 9/24, 9/32*

U.S. Cl. 260—17.3 **8 Claims**

A urea-formaldehyde resin for use in bonding glass fibres comprises 1 mole of urea together with from 3 to 5 moles of formaldehyde copolymerised with 0.05 mole of a polyol and from 10 to 50% of a lactam based on the amount of urea present.

3,637,550

SILANATED POLYAMIDE ADHESIVE AND ITS PREPARATION

Jerome W. Sprauer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of applications Ser. No. 630,548, Apr. 13, 1967, and Ser. No. 832,422, June 11, 1969. This application Jan. 23, 1970, Ser. No. 5,353

Int. Cl. S08h *9/00;* **C09j** *3/14*

U.S. Cl. 260—18 **17 Claims**

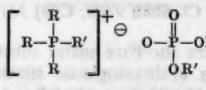
Adhesive binders for bare metal substrates predominantly comprising a thermoplastic silanated polyamide prepared by melt blending a melt-polymerized polyamide consisting essentially of recurring carboxyamido groups and at least two different species of recurring hydrocarbylene groups selected from the group consisting of aliphatic and alicyclic groups of 2 to 48 carbon atoms as integral parts of the main polymer chain, and having at least three different recurring polyamide repeat units, a crystalline melting point below about 230° C., a melt index of about 0.1 to 200, a moisture content of less than about 0.5 weight percent, and at least as many amine ends as carboxyl ends, at a temperature above the crystalline melting point of the polyamide, with about 0.1 to 3 percent, based on the weight of the polyamide, of a silanating compound of the formula $(RO)_3—Si—R^1—Q$ in which R is alkyl or alkoxyalkyl, R^1 is hydrocarbylene selected from the group consisting of saturated aliphatics, saturated alicyclics and aromatics of 2 to 40 carbon atoms, and Q is a radical selected from the group consisting of amine, oxirane, alkoxycarbonyl, carboxyl, hydroxyl, aldehyde, amide, anhydride, carbamate, isocyanate, isocyanide, isothiocyanate, isothiourea, ketoxime, lactide, mercapto, oxime, ozonide, peroxide, thial, thiocyanate and ureido.

3,637,551
MELT-CONDENSED POLYAMIDE INTERPOLYMER ADHESIVES
Jerome W. Sprauer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 832,422, June 11, 1969. This application May 21, 1970, Ser. No. 39,574
Int. Cl. C08g *20/20*
U.S. Cl. 260—18 **9 Claims**

Melt-condensed polyamide interpolymers consisting essentially of at least three different recurring polyamide repeat units in which about 20–100 mole percent of the imine groups are derived from polymethylene diamine of 6 to 20 carbons, about 5–65 mole percent of the carbonyl groups are derived from dimerized fatty acid of 16 to 48 carbons, about 8–65 mole percent of the carbonyl groups are derived from polymethylene diacid of 6 to 18 carbons, and about 8–65 mole percent of the carbonyl groups are derived from monomer selected from the group consisting of polymethylene diacid of 6 to 18 carbons different from the above diacid and polymethylene omega-aminoacid of 6 to 18 carbons, and which has an annealed heat of fusion of about 5 to 18 calories per gram, is quenchable to the amorphous state at a cooling rate of about 100° C. per minute, and has a glass transition temperature in the amorphous state of less than about 30° C., are useful as adhesives, particularly as adhesives for forming metal cans having side lapped seams.

3,637,552
FLAME RETARDANT, ANTISTATIC POLYMERS
Roland J. Bryan, Jr., Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed July 8, 1970, Ser. No. 53,296
Int. Cl. C08g *51/54*; C08k *1/66*
U.S. Cl. 260—18 R **10 Claims**

The flame-resistance and antistatic properties of fabrics formed from thermoplastic polymer filaments containing from 2 to 15% by weight, based on the weight of polymer, of a polyalkoxylated compound are greatly improved by incorporating into said filaments in combination with the polyalkoxylated compound from 2 to 15% by weight, based on the weight of the polymer of an alkyl phosphonium phosphate of the formula



wherein each R and R′ is an alkyl radical having from 1 to 20 carbon atoms.

3,637,553
PRODUCTION OF HOMOGENEOUS, THERMOPLASTIC, AND HIGHLY ELASTIC PLASTICS FROM VINYL CHLORIDE POLYMERS AND POLYURETHANES
Wolfgang Keberle, Leverkusen, and Wilhelm Göbel, Cologne-Flittard, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Sept. 24, 1969, Ser. No. 860,810
Claims priority, application Germany, Oct. 11, 1968, P 18 02 471.0
Int. Cl. C08f *45/24*; C08g *41/04*
U.S. Cl. 260—23 **9 Claims**

Polyvinyl chloride stabilizers are readily and acceptably introduced into vinyl or vinylidene chloride polymer/polyurethane mixtures by using polyurethane dispersions containing polyvinyl chloride stabilizers either in solution or in fine distribution in the discrete polyurethane dispersion particles to prepare the vinyl chloride polymer/polyurethane plastics mixtures from vinyl chloride polymer dispersions and polyurethane dispersions, by admixture and co-coagulation.

3,637,554
POLYSTYRENE COMPOSITIONS
Clifford W. Childers, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Continuation-in-part of abandoned application Ser. No. 485,532, Sept. 7, 1965. This application Nov. 7, 1966, Ser. No. 592,323
Int. Cl. C08f *19/08, 41/12*
U.S. Cl. 260—23.7 R **7 Claims**

Preparation of polystyrene compositions of improved impact strength, tensile strength, and elongation by blending with polystyrene one or more branched radial block copolymers.

3,637,555
ADDITIVE SYSTEMS FOR ABS GRAFT COPOLYMERS
Paul J. Marinacci, Monroe, Conn., and Joseph M. Kelley, Westfield, Frederick E. Carrock, Paramus, and Edward E. Allemand, Oak Ridge, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.
No Drawing. Filed Sept. 30, 1968, Ser. No. 763,906
Int. Cl. C08d *5/00*; C08f *45/58*
U.S. Cl. 260—23.7 **11 Claims**

ABS resins have improved stability against degradation due to heat and oxygen by addition of a balanced stabilizer composition which maintains initial color and impact strength, minimizes melt flow changes, and reduces tendency for carbonyl formation in the ABS resin during long term heat aging (LTHA). This composition comprises for example, 0.05 to 1.0 percent of each of the following constituents:

(1) DLTDP,
(2) 2,6-di-t-butyl-4-methylphenol,
(3) 2,2′-methylenebis(4-ethyl-6-t-butylphenol), and
(4) an epoxy compound derived from soybean oil or by the condensation of an ethylene oxide with a hydroxy-containing compound.

3,637,556
SEALING COMPOSITION CONTAINING A GELLED POLYBUTENE OIL PLASTICIZER
James H. Brillinger, Westfield, N.J., assignor to W. R. Grace & Co., Cambridge, Mass.
No Drawing. Continuation-in-part of application Ser. No. 537,321, Mar. 25, 1966. This application July 9, 1969, Ser. No. 840,486
Int. Cl. C08d *9/08*
U.S. Cl. 260—23.7 **11 Claims**

A sealing composition particularly suited for caulking joints, cracks, etc., contains butyl or halogenated butyl rubber, a solvent for the rubber and a polybutene oil gelled with, e.g., aluminum stearate as a plasticizer. The composition can additionally contain a drying oil and fillers.

3,637,557
ESTERS OF TRIS(POLYALKYLENEOXY) ISOCYANURATES
Edwin D. Little, Convent Station, N.J., assignor to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Sept. 23, 1969, Ser. No. 860,402
Int. Cl. C07d *55/38*
U.S. Cl. 260—248 NS **10 Claims**

Triesters of tris(hydropolyoxyalkylene)isocyanurates and alkanoic or alkenoic acid are fluid over a wide temperature range. The products are useful in functional fluid

and lubricating applications, such as lubricating additives to gasoline.

3,637,558

ELASTOMERIC COMPOSITIONS FROM ASPHALT AND PARTIALLY UNCURED URETHANES OF ALLYLIC, HYDROXYL-TERMINATED DIENE POLYMERS

Joseph A. Verdol, Dolton, and Patrick W. Ryan, Chicago Heights, Ill., assignors to Atlantic Richfield Company

No Drawing. Continuation of application Ser. No. 536,301, Mar. 22, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 465,161, June 18, 1965. This application Jan. 23, 1969, Ser. No. 797,347

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 18 Claims

Compositions containing asphalt and urethane which is the reaction product of a diisocyanate with an intermediate polyhydroxy polymer having an average of at least about 1.8 predominantly primary, terminal, allylic hydroxyl groups per molecule and being an addition polymer of 0–75% by weight of an alpha-olefinic monomer of 2 to 12 carbon atoms, and about 25 to 100% of a 1,3-diene hydrocarbon of 4 to about 12 carbon atoms, the intermediate polyhydroxy polymer having a viscosity at 30° C. of about 5–20,000 poises and a number average molecular weight of about 400–25,000. The urethane component is at least partially uncured when combined with the asphalt. These rubberized asphalt compositions are easily worked and can be used alone for patching, crack-filling and weatherproof coatings, or can be mixed with other materials, such as granular, inorganic, often siliceous materials and with conventional paving aggregates to make paving compositions. The material sets up to an elastomeric composition after the paving composition is applied to the road surface. These compositions possess improved low temperature flexibility, improved adhesion, high abrasion resistance, decreased tack and little tendency to bleed at elevated temperatures.

3,637,559

METHYL METHACRYLATE POLYMER-IN-MONOMER COMPOSITION

Paul S. Pinkney, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 705,225, Feb. 13, 1968, which is a continuation of application Ser. No. 437,307, Mar. 4, 1965, both now abandoned. This application Sept. 29, 1969, Ser. No. 862,083

Int. Cl. C08f *45/52, 17/00*

U.S. Cl. 260—28.5 9 Claims

Quick-hardening, durable coating compositions of the substantially 100 percent solids type are formulated from methyl mehacrylate monomer/polymer sirup, a methacrylate compound having at least three methacrylate ester groups, paraffin wax, titanium dioxide, a substituted aniline activator, a benzoyl or chlorobenzoyl peroxide, and preferably a hindered phenol stabilizer.

3,637,560

PREPARATION OF AQUEOUS METHYLSILSESQUIOXANE DISPERSIONS

Joseph Cekada, Jr., Midland, Mich., assignor to Dow-Corning Corporation, Midland, Mich.

No Drawing. Filed Mar. 13, 1967, Ser. No. 622,417

Int. Cl. C08g *31/12, 51/24*

U.S. Cl. 260—29.2 M 6 Claims

Stable aqueous dispersions of methylsilsesquioxane are prepared by contacting an alkali or alkaline earth metal monomethylsiliconate with an acid cation exchange resin and employing an anionic or cationic surfactant. The dispersion may subsequently be neutralized. These dispersions are useful for imparting dulling, antislip, and antisoiling characteristics to fabrics.

3,637,561

SULFONATED PHENOLIC-UREA RESIN SYSTEM

Joel M. Schnur, Agawam, and Rodney M. Huck, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,396

Int. Cl. C08g *51/24;* C09d *5/02*

U.S. Cl. 260—29.3 3 Claims

A liquid sulfonated phenolic-urea mixed resin system which has improved bench life and low formaldehyde evolution during thermosetting. The system is useful in foundries for the production of sand cores at a rapid rate.

3,637,562

BIURET-UREA-FORMALDEHYDE RESINS

George O. Orth, Jr., Seattle, Wash., assignor to Nipak, Inc., Dallas, Tex.

Filed June 30, 1969, Ser. No. 837,390

Int. Cl. C08g *9/10, 9/12*

U.S. Cl. 260—29.4 R 20 Claims

A method of forming a biuret-urea-formaldehyde polymer and the product thereof, including, mixing formaldehyde with the biuret, in the ratio of 0.8 to 1.1 moles of formaldehyde per mole of primary amide group in the biuret and the hereaftermentioned urea, in the presence of an acid, such as hydrochloric acid, formic acid, etc., in an amount sufficient to attain a pH between about 3.7 and 4.8, and maintaining a temperature between about 70 and 100° C. for a predetermined period of time and thereafter adding the urea in an amount such that the ratio of biuret to urea is between about 0.4 and 9, adjusting the pH with an acid or a base to a value of about 3.7 to 5.6 and cooking the solution for a predetermined period of time. The exothermic reaction can be moderated by the addition of a buffer, such as disodiumcyanurate, sodium acetate, sodium borate, sodium phosphate, sodium citrate, etc., in amounts of about 1 to 12% based upon the volume of urea and biuret. The resultant polymer may be cured by the addition thereto of an appropriate catalyst, such as ammonium chloride, ammonium sulfate, ammonium phosphate, etc., in amounts of about 1 to 1.5% by weight, based on resin solids.

3,637,563

PREPARATION OF HIGH SOLIDS POLYMER AQUEOUS EMULSIONS

Ray C. Christena, Wichita, Kans., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 725,539, Apr. 30, 1968, which is a continuation-in-part of application Ser. No. 657,895, Aug. 2, 1967. This application May 20, 1969, Ser. No. 826,254

Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 R 32 Claims

High solids aqueous polymer emulsions are produced by first admixing a surfactant with one or more polymerizable monomers each containing at least one olefinic double bond, together with an amount of water corresponding to between about 6% and about 25% by weight based on the total weight of monomer employed. The resultant pre-emulsion is then added to an aqueous medium and polymerized in the reactive presence of a free radical polymerization catalyst.

3,637,564

DISSOLUTION OF POLYACRYLAMIDES

Peter Economou, Bedford, Mass., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 546,214, Apr. 29, 1966. This application July 22, 1969, Ser. No. 843,806

Int. Cl. C08f *29/00, 29/34, 47/18*

U.S. Cl. 260—29.6 H 9 Claims

The dissolution of dry particulate anionic vinyl polymers in water is accelerated when the water has a dissolved content of a cationic polyamine and an ionization suppressor for the anionic substituent of the polymer.

3,637,565

LATEX COMPOSITIONS HAVING IMPROVED ADHESION

David P. Sheetz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 30, 1964, Ser. No. 414,834

Int. Cl. C08f *45/34, 1/13*

U.S. Cl. 260—29.6 TA 5 Claims

Stable, cationic latices are prepared by emulsion polymerization at a pH value of below 7 of (1) (a) a primary or secondary amino alcohol ester of an α,β-ethylenically unsaturated carboxylic acid and an α,β-ethylenically unsaturated carboxylic acid or (b) a primary or secondary amino alcohol half ester of an α,β-ethylenically unsaturated dicarboxylic acid with (2) at least one other polymerizable ethylenically unsaturated substantially water-insoluble monomer. To these cationic latices may be added a non-ionic surfactant and a base-acting material to raise the pH to a value greater than 8 to obtain anionic latices which have desirable adhesive properties and are compatible with conventional paint formulating ingredients.

3,637,566

TERPOLYMER OF AN OLEFIN VINYL MONOMER AND A PARTIAL ESTER OF AN UNSATURATED ACID ANHYDRIDE WITH AN ETHOXYLATED ALKYL ALCOHOL

Oliver deS. Deex, Clayton, and William F. Fallwell, Jr., St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 29, 1968, Ser. No. 732,887

Int. Cl. C08f *15/40, 29/48*

U.S. Cl. 260—29.6 TA 10 Claims

This invention relates to terpolymers of an olefinically unsaturated hydrocarbon, vinyl-type monomers and hydroxyl containing non-ionic dispersing agent partial esters of unsaturated polybasic carboxylic acid and their use as pigment binders in mineral coated paper. The non-ionic dispersing agent is represented by the formula

$$H—(OCH_2CH_2)_n—OR$$

where n is 5 to 60 and R is an alkyl group. A polymer of ethylene vinyl chloride and the ethoxylated tridecyl half ester of maleic acid is a representative terpolymer of this invention.

3,637,567

STABLE AQUEOUS EMULSIONS

Marvin M. Fein, Westfield, and Eugene S. Barabas, Watchung, N.J., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed May 4, 1970, Ser. No. 34,571

Int. Cl. C08d *7/00*

U.S. Cl. 260—29.7 U 4 Claims

A stable water emulsion of a poly (N-vinyl lactam) engrafted with isoprene and styrene side chains is disclosed.

3,637,568

SYNTHETIC RESIN MOLDING COMPOSITIONS CONTAINING N-ALKYLGLUCONAMIDES

Koichi Sato, Osaka, Norifusa Tamugi, Kawasaki, and Katsutoshi Abe, Ikeda, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

No Drawing. Filed Mar. 23, 1970, Ser. No. 22,035

Claims priority, application Japan, Mar. 24, 1969, 44/22,209

Int. Cl. C08f *45/44;* C08g *51/44*

U.S. Cl. 260—32.6 6 Claims

Use of N-alkylgluconamides of the formula:

$$R—NHCO(CHOH)_4CH_2OH$$

wherein R is an alkyl group having 1 to 24 carbon atoms as an additive for molding synthetic resins, especially as a lubricant for thermoplastic resin, a releasing agent for thermosetting resin, and an antistatic agent for both resins, and resinous compositions for molding containing the said N-alkylgluconamide.

3,637,569

PROCESS FOR PREPARING FLUOROCARBON RESIN ORGANOSOLS

James C. Fang, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of applications Ser. No. 413,333, Nov. 23, 1964, Ser. No. 528,047, Feb. 17, 1966, Ser. No. 654,333, July 19, 1967, Ser. No. 738,821, June 21, 1968, and Ser. No. 19,062, Mar. 12, 1970. This application July 1, 1970, Ser. No. 51,717

Int. Cl. B01f *3/12;* C08f *45/28, 45/34*

U.S. Cl. 260—32.8 R 6 Claims

A process for preparing a dispersion of tetrafluoroethylene/hexafluoropropylene copolymer in an organic liquid, which comprises mixing an organic liquid with an aqueous dispersion of copolymer, boiling the mixture, taking off the resulting azeotrope, separating the water from the azeotrope and returning the organic liquid to the boiling mass until it is substantially anhydrous.

3,637,570

PROCESS FOR PRODUCING PROTECTIVE COATING OF SILOXANE RESIN AND PRODUCT PRODUCED

Robert L. Stout, Dayton, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed Feb. 25, 1969, Ser. No. 802,249

Int. Cl. C08g *51/28*

U.S. Cl. 260—33.6 SB 9 Claims

The process described herein comprises the mixing of a siloxane prepolymer having repeating units of the formula

$$\begin{array}{c} R'' \\ | \\ —Si—O— \\ | \\ R'' \end{array}$$

with 3–25 parts per 100 of prepolymer of a curing agent comprising an amino-alkyl-alkoxyl-silane having the formula

$$R_2N—R'—\overset{(R'')_n}{\overset{|}{Si}}(OR'')_{(3-n)}$$

wherein R is selected from the group consisting of hydrogen, alkyl, cycloalkyl and amino-alkyl radicals; R′ is a divalent hydrocarbon radical having at least three carbon atoms and having the valence bonds which are attached to the N and Si of the formula separated by at least three carbon atoms; R″ is a monovalent hydrocarbon radical having one to six carbon atoms; and n is an integer having a value of 0–2. These components are mixed in an inert

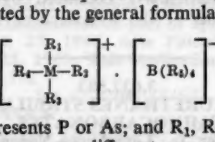
solvent such as xylene or toluene in a proportion so as to produce a solution of approximately 50–60 percent by weight solids, allowing the components to react in solution for a period of 30–60 minutes, thereafter applying the solution as a coating on a solid substrate, and curing the applied film by air-drying at a temperature of about 20–40° C. The coating cures in a relatively short time, even without modifiers and without heating, to a film capable of withstanding temperatures of 650° F. for extended periods.

3,637,571
PROCESS FOR PREPARING THERMOPLASTIC RESIN-ADDITIVE COMPOSITIONS
Walter Polovina, Princeton, N.J., assignor to Rexall Drug and Chemical Company, Los Angeles, Calif.
No Drawing. Filed Apr. 15, 1968, Ser. No. 721,209
Int. Cl. C08f *45/04;* **C08g** *51/04, 53/04*
U.S. Cl. 260—34.2 R **5 Claims**

The process comprises preparing a liquid formulation of solid additives such as pigments dissolved or dispersed in a suitable media such as water or aliphatic hydrocarbons, removing all the agglomerates and combining the resulting formulation with a thermoplastic resin. The resulting mixture is then dried and can be either extruded or milled and reduced into pellets or chips of resin-additive compositions or concentrates. The concentrates are blended with the respective base resins to achieve the desired modifications of the physical and chemical properties of the base.

3,637,572
EPOXY RESINS WITH ORGANOBORON CURE PROMOTORS
Masatzugu Ogata, Mikio Sato, Yutaka Watanabe, and Hiroshi Suzuki, Hitachi, Japan, assignors to Hitachi, Ltd., and Hitachi Chemical Company, Ltd., both of Tokyo, Japan
Filed May 21, 1970, Ser. No. 39,224
Claims priority, application Japan, May 26, 1969, 44/40,189, 44/40,190
Int. Cl. C08g *51/04, 17/13, 33/10*
U.S. Cl. 260—37 EP **10 Claims**

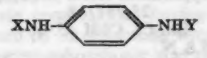
An epoxy resin composition improved in curability and pot life (storing stability) which is prepared by blending an epoxy resin with an acid anhydride curing agent and a curing promotor composed of an organoboron compound represented by the general formula,



wherein M represents P or As; and R_1, R_2, R_3, R_4 and R_5, which may be same or different, represent individually an alkyl, alkenyl or aryl group.

3,637,573
POLYURETHANES STABILIZED WITH p-PHENYLENEDIAMINES
Noritoshi Mise, Ikeda, Minoru Yamada, Suita, and Kenichi Nishino, Takatsuki, Japan, assignors to Takeda Chemical Industries Ltd., Osaka, Japan
No Drawing. Filed Nov. 27, 1967, Ser. No. 685,947
Claims priority, application Japan, Nov. 28, 1966, 41/78,195
Int. Cl. C08g *51/60, 51/08*
U.S. Cl. 260—37 N **6 Claims**

A stabilized polyurethane composition containing p-phenylenediamine of the following formula:



wherein each of X and Y stands for a substituted or unsubstituted hydrocarbon group.

3,637,574
SULFUR MODIFIED ZINC COMPOUND/TETRAALKYLTHIURAM POLYSULFIDE CURE SYSTEM FOR LIQUID POLYTHIOL POLYMERS
Edward G. Millen, Princeton, N.J., assignor to Thiokol Chemical Corporation, Bristol, Pa.
Filed Jan. 16, 1969, Ser. No. 791,681
Int. Cl. C08g *25/00*
U.S. Cl. 260—37 R **13 Claims**

Room temperature cured sealant composition having greatly improved physical properties is obtained by curing a curable polymeric sealant composition comprising a liquid polythiol polymer, e.g. —SH terminated liquid polysulfide polymer, by means of a curing agent system comprising a zinc compound and a tetraalkylthiuram polysulfide essentially modified by the addition of up to about 10 parts by weight of sulfur per 100 parts by weight of the polymer. The cured composition has utility as a sealant for waterproofing, caulking and similar applications where a relatively rapid room temperature cure is desired.

3,637,575
PROCESS FOR HOMOGENEOUSLY COLORING COPOLYMERS OF TRIOXANE
Edgar Fischer, Frankfurt am Main, and Karl-Heinz Häfner, Bad Orb, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Continuation-in-part of abandoned application Ser. No. 644,095, June 7, 1967. This application Aug. 18, 1969, Ser. No. 851,042
Claims priority, application Germany, June 18, 1966, F 49,496
The portion of the term of the patent subsequent to July 8, 1986, has been disclaimed
Int. Cl. C08f *3/40*
U.S. Cl. 260—37 P **7 Claims**

Thermostable colored polyacetals are prepared by reacting a copolymer of trioxane containing aldehyde groups with a disperse dyestuff. They are suitable for coloring uncolored polyacetals and they are especially processed into colored blown films and transparent colored shaped articles.

3,637,576
EPDM RUBBER INSULATING COMPOSITION
Gordon Sutherland, Wilmington, Del., assignor to the United States of America as represented by the Secretary of the Navy
No Drawing. Filed Apr. 22, 1970, Ser. No. 30,970
Int. Cl. C08g *37/18*
U.S. Cl. 260—38 **10 Claims**

An insulating composition for the inside of rocket motors comprising (1) a rubber comprising ethylene, propylene and a diene selected from the group consisting of methylylidene norbornene and ethylidene norbornene, (2) carbon or silica (3) asbestos (4) zinc oxide and (5) bromomethyl alkylated phenolformaldehyde resin.

3,637,577
CURING OF FOUNDRY MOLDS AND CORES BY INDUCTION HEATING
Vernon L. Guyer, Minneapolis, and Robert J. Schafer, Edina, Minn., assignors to Ashland Oil, Inc., Ashland, Ky.
No Drawing. Filed June 19, 1967, Ser. No. 647,247
Int. Cl. C08g *51/04*
U.S. Cl. 260—38 **31 Claims**

A process for the catalytic cross-linking of a curable material, comprising, in sequence, the steps of:

(A) forming a mixture comprising:

(1) the curable material, and

(2) a catalytic agent which, upon heating, releases a catalyst which promotes curing of the curable material, and

(3) an inductively heatable material in thermal proximity with the catalytic agent, and then

(B) subjecting the mixture to an alternating inductive field,

whereby the heat generated in the inductively heatable material is transferred to the catalytic agent, releasing the catalyst and promoting curing of the curable material.

A catalytic pill adapted to promote curing of a curable material when subjected to an alternating inductive field, said pill comprising:

(A) an inert catalytic agent which, upon heating, releases a catalyst which promotes curing of the curable material, and

(B) an inductively heatable material in thermal proximity with the catalytic agent.

This invention finds particular utility in the foundry art when the mixture further contains a foundry aggregate.

3,637,578

POLYESTER-POLYPHENYLENE ETHER MIXED RESINS

Carl L. Wright, Severn, and Harry H. Beacham, Severna Park, Md., assignors to FMC Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 699,813, Jan. 23, 1968. This application Apr. 23, 1970, Ser. No. 31,407

Int. Cl. C08f *43/06*; C08g *43/02*

U.S. Cl. 260—40 R **8 Claims**

Thermosetting resin compositions of improved qualities made by combining a high-temperature thermoplastic resin, i.e., a polyphenylene ether polymer with mixtures of reactive monomers and reactive-type polyester resins, each containing polymerizable carbon-to-carbon unsaturation. The polyphenylene ether polymers combine with these polymerizable materials containing carbon-to-carbon unsaturation in the presence of a free radical catalyst. The compositions are formed by moderate heat and pressure into articles with excellent electrical and mechanical properties which are retained at elevated temperatures, and under conditions of high humidity.

3,637,579

POLYEPOXIDE-POLYANHYDRIDE ADHESIVE COMPOSITION

Walter P. Barie, Jr., Shaler Township, and Norman W. Franke, Penn Hills Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Dec. 18, 1969, Ser. No. 886,392

Int. Cl. C08f *45/04*; C08g *51/04*

U.S. Cl. 260—41 A **11 Claims**

An adhesive composition containing a copolymer of a straight chain mono-alpha-olefin and maleic anhydride, a liquid polyepoxide, and a powdered filler. The adhesive is useful for bonding solid elements, such as metal, together.

3,637,580

METHOD FOR PREVENTING SAGGING OF COATING MATERIALS

Kenichi Hattori and Atushi Goukon, Wakayama-shi, Yoshiaki Komeda, Tokyo, and Hiroshi Mori, Wakayama-shi, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

No Drawing. Filed Aug. 25, 1969, Ser. No. 852,933

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 R **4 Claims**

A paint composition containing from 0.05 to 10% by weight, based on the total weight of the paint composition, of an antisagging agent made by reacting one mole of a dimer acid with 0.1 to 0.99 mole of a glycol of the formula $HO—(CH_2CH_2O)_n—H$, wherein n is a number from 1 to 30, until the hydroxyl value of the reaction mixture reaches a constant value of less than 10.

3,637,581

METHOD OF MAKING CHROMOGEN-BONDED-POLYMER AND PRODUCTS THEREOF

Shojiro Horiguchi, 965 Shimohoya, Hoyamachi, Kitatamagun, Tokyo, Japan, and Michiei Nakamura, 156, 5-chome, Motobuto-cho, Urawa-shi, Saitama-ken, Japan

Continuation-in-part of application Ser. No. 477,946, Aug. 6, 1965. This application Aug. 4, 1967, Ser. No. 658,465

Int. Cl. B44d *1/00*; C08d *11/00*; C08f *45/04*

U.S. Cl. 260—41.5 R **21 Claims**

A method of making a metal phthalocyanine-bonded-polymer comprising diazotizing triamino metal phthalocyanine in aqueous medium containing hydrochloric acid in a quantity which exceeds its theoretical quantity by at least 10 moles per one amino radical to produce the diazotized product comprising diazotized triamino metal phthalocyanine, stabilizing the diazotized product with a stabilizer to produce the stabilized diazo compound, mixing the stabilized diazo compound with an addition-polymerizable monomer and polymerizing said monomer using the stabilized diazo compound as an initiator for the polymerizing to form the metal phthalocyanine-bonded-polymer and the metal phthalocyanine-bonded-polymer made thereby.

3,637,582

HYDROXYPHENYLALKYLENEYL ISOCYANURATES

Jack C. Gilles, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Original application Oct. 25, 1968, Ser. No. 770,863, now Patent No. 3,531,483, dated Sept. 29, 1970. Divided and this application Dec. 29, 1969, Ser. No. 1,927

Int. Cl. C08f *45/60*; C10m *1/32*; C11b *5/00*

U.S. Cl. 260—45.8 N **22 Claims**

Novel hydroxyphenylalkyleneyl isocyanurates have been prepared. These compounds stabilize organic materials against the deleterious effects of oxygen, heat and light. The stability of α-monoolefin homopolymers and copolymers is particularly enhanced by incorporating stabilizing amounts of the hydroxybenzyl isocyanurates therein.

3,637,583

POLYESTERURETHANES STABILIZED WITH IMINOCARBONATES

Sidney H. Metzger, Jr., Leverkusen-Neuenhof, Germany, and John E. Over, Pittsburgh, Pa., assignors to Mobay Chemical Company, Pittsburgh, Pa.

No Drawing. Filed Oct. 23, 1968, Ser. No. 770,117

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.8 A **6 Claims**

Polyester compositions stabilized against hydrolysis and ageing are prepared by incorporating therein iminocarbonate compounds.

3,637,584

STABILIZATION OF POLYOLEFINS

Ronald James Hurlock and Eric Samuel Nicholson, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed May 19, 1969, Ser. No. 825,933

Claims priority, application Great Britain, May 30, 1968, 25,981/68

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.8 N **4 Claims**

Poly-α-olefins derived from mono olefins containing three or more carbon atoms are stabilised against oxida-

tive degradation by 1,3-imidazoles in which the 4 and 5 positions are substituted by aryl groups and the 2 position by a 2-hydroxyphenyl or 4,5-diaryl-1,3-imidazole group.

3,637,585

ANTIOXIDATION OF ORGANIC COMPOSITIONS

Patrick D. Beirne, Farmington, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Original application Jan. 26, 1966, Ser. No. 523,025, now Patent No. 3,465,029, dated Sept. 2, 1969. Divided and this application Nov. 4, 1968, Ser. No. 773,275

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.85 R 12 Claims

Esters of (3,5 - dihydrocarbyl-4-hydroxybenzyl)thiodicarboxylic acids are effective stabilizers for organic material. For example, dilauryl[(3,5 - di-tert-butyl-4-hydroxybenzyl)thio]succinate prolongs the life of polypropylene. Effectiveness is synergistically increased by inclusion of an ester of a thiodialkanoic acid such as dilaurylthiodipropionate.

3,637,586

STABLE PLASTIC COMPOSITIONS

Bernard R. Meltsner, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Original application July 9, 1965, Ser. No. 470,891, now Patent No. 3,476,814, dated Nov. 4, 1969. Divided and this application Aug. 4, 1969, Ser. No. 847,402

Int. Cl. C08f *45/58*; C08g *51/58*

U.S. Cl. 260—45.95 5 Claims

Mono- and di - (3,5 - dihydrocarbyl - 4 - hydroxybenzyl)phenyl alkyl ethers are useful either alone or in synergistic combination with a dialkyl thiodialkanoate as antioxidants for a broad range of organic material.

3,637,587

STABILIZATION OF ORGANIC SUBSTANCE WITH N,N-DISUBSTITUTED-AMINOALKYL PHOSPHITE

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 589,841, Oct. 27, 1966, now Patent No. 3,480,698, dated Nov. 25, 1969. This application Mar. 25, 1969, Ser. No. 810,372

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.9 R 10 Claims

Stabilizing organic substance by incorporating therein the stabilizing concentration of an N,N-dialkylaminoalkyl phosphite or N,N-dicycloalkyl-aminoalkyl phosphite. One example is the stabilizing of plastics and another example is the stabilization of hydrocarbon distillates.

3,637,588

POLYOLEFINS STABILIZED WITH MIXTURES COMPRISING A PHOSPHORUS ACID AND A PHENOL

James S. Dix and Ronald D. Mathis, Bartlesville, Okla., and Leslie T. Netherton, Fayetteville, Ark., assignors to Phillips Petroleum Company

No Drawing. Filed Jan. 17, 1969, Ser. No. 792,142

Int. Cl. C08f *45/58, 45/60, 45/62*

U.S. Cl. 260—45.75 N 5 Claims

Polyolefin resin compositions having improved properties are obtained by incorporating with the resins small amounts of an organophosphonic acid or an organophosphinic acid in combination with other stabilizers, e.g., a benzophenone and a phenol.

3,637,589

METHOD FOR PREPARING POLY-CARBORANYL-ENESILOXANE POLYMERS

Herbert R. Kwasnik, Silver Spring, Md., and John F. Sieckhaus, Milford, and Karl O. Knollmueller, Hamden, Conn., assignors to Olin Corporation

No Drawing. Filed May 28, 1970, Ser. No. 41,598

Int. Cl. C08g *31/30*

U.S. Cl. 260—46.5 E 8 Claims

This invention relates to the method for the preparation of linear poly-meta(-m-) and para (-p-) carboranylenesiloxanes by the controlled hydrolytic condensation of selected silicon-containing carboranes.

For example, 1.473 moles of H_2O in 400 ml. tetrahydrofuran was added over a period of 30 minutes to a flask cooled with an ice-bath and containing 1.052 moles of bis(1,1,3,3 - tetramethyl - 3 - chlorodisiloxane) - m-carborane and 2100 mol. of diethyl ether. Stirring was continued for another 30 minutes; the flask was warmed to 25° C. and after 2½ hours, the solvents were stripped under reduced pressure. After removing the last traces of solvent the polymer obtained had a number average molecular weight of 10,000.

The polymers obtained by the controlled hydrolytic condensation have utility as high temperature liquids and coatings, gaskets. O-rings, encapsulation materials, heat resistant adhesives and in liquid partitioning phases used in vapor phase chromatography.

3,637,590

THERMOPLASTIC POLYETHER RESINS OF BISPHENOLS

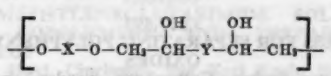
Russel L. Maycock, 7206 Prestwick St., Houston, Tex. 77025, and Alton J. Landua, 280 Wyoming Ave., Maplewood, N.J. 07040

No Drawing. Continuation-in-part of application Ser. No. 598,527, Aug. 8, 1966, which is a division of application Ser. No. 145,486, Oct. 16, 1961, now Patent No. 3,306,872, which in turn is a continuation-in-part of application Ser. No. 46,387, Aug. 1, 1960. This application Mar. 31, 1970, Ser. No. 24,357

Int. Cl. C08g *30/04*

U.S. Cl. 260—47 EP 8 Claims

Novel thermoplastic polyethers having high impact resistance consist essentially of linear molecules having a repeating structure



wherein X is the central or residue group, between the —OH groups, of a dihydric polynuclear phenol and Y the central or residue group, between the oxirane rings, of a terminal di-vic-epoxide. Preferred are those polyethers in which X and Y are the residue groups, respectively, of bisphenols and of diglycidyl ethers or lower polyethers of bisphenols, especially preferred bisphenols being bisphenol A and 4,4'-dihydroxydiphenylmethylphenylmethane.

3,637,591

EPOXY RESIN COMPOSITIONS

Aubert Y. Coran, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation of abandoned application Ser. No. 823,957, May 12, 1969, which is a continuation-in-part of abandoned application Ser. No. 791,792, Feb. 9, 1959. This application Apr. 27, 1970, Ser. No. 32,417

Int. Cl. C08g *30/02, 30/04, 45/00*

U.S. Cl. 260—47 EC 17 Claims

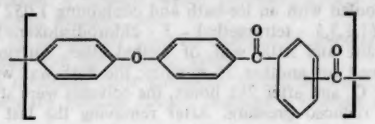
An epoxide resin composition suitable for curing and a process for preparing the same are provided wherein a neutral ester of a phosphorous acid is incorporated in a mixture of an epoxide resin and a curing agent free from a BF_3-organic base complex.

3,637,592
CRYSTALLINE COPOLYKETONE FILM STRUCTURES

Charles E. Berr, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 702,802, Feb. 5, 1968. This application June 10, 1970, Ser. No. 45,232
The portion of the term of the patent subsequent to June 23, 1987, has been disclaimed
Int. Cl. C08g *33/10*
U.S. Cl. 260—47 R 8 Claims

Crystalline copolyketone film structures having the following repeating structural unit



wherein the

moiety is either

(T moiety) or

(I moiety), and the *T:I* ratio varies from 90:10 to 50:50 are provided; crystallized film structures are useful in a variety of applications, for example, electrical insulation.

3,637,593
PROCESS FOR SEPARATING POLYPHENYLENE OXIDES

Hans-Dieter Becker, Gothenburg, Sweden, and Alfred R. Gilbert, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed July 9, 1970, Ser. No. 53,649
Int. Cl. C08g *23/18*
U.S. Cl. 260—47 ET 6 Claims

Diphenoquinones present in polyphenylene oxides as a result of oxidation of diorganophenols can be separated from the polyphenylene oxides as biphenols by treatment of the mixture of the polyphenylene oxide and the diphenoquinone with a hydrogen halide.

3,637,594
HIGH MOLECULAR WEIGHT AROMATIC POLYBENZOXAZINONES

Manfred Gallus, Gunter Lorenz, and Gunther Nischk, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

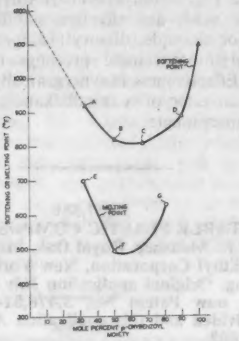
No Drawing. Filed May 29, 1969, Ser. No. 829,124
Claims priority, application Germany, June 10, 1968, P 17 70 608.0
Int. Cl. C08g *20/08, 33/02*
U.S. Cl. 260—47 CP 10 Claims

High molecular weight aromatic polybenzoxazinones and a process for their production by polycondensation of aromatic diaminocarboxylic acids containing ether oxygen with aromatic dicarboxylic acid dihalides in polar organic solvents, and heating the polyamide carboxylic acids thus obtained at temperatures above 150° C. said polymers being useful in the form of films and foils.

3,637,595
P-OXYBENZOYL COPOLYESTERS

Steve G. Cottis, 85 Niagara Falls Blvd. 14214; James Economy, 465 Ruskin Road 14226, both of Buffalo, N.Y.; and Bernard E. Nowak, 148 Seneca Place, Lancaster, N.Y. 14086

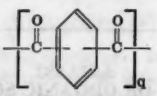
Filed May 28, 1969, Ser. No. 828,484
Int. Cl. C08g *17/02, 17/08*
U.S. Cl. 260—47 C 13 Claims



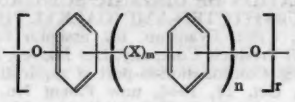
A polyester of recurring moieties of Formulae I, II and III:

(I)

(II)



(III)



wherein X is —O— or —SO_2—; *m* is 0 or 1; *n* is 0 or 1; and *p*, *q* and *r* are preferably present in certain defined ratios.

3,637,596
COPOLYMERS OF BUTADIENE AND/OR COPOLYMERIZABLE CARBOXYLIC NITRILES AND OTHER MONOMERS WHICH RESIST YELLOWING

Klaus Gulbins, Limburgerhof, Hans Wilhelm, Heinsheim, Heinrich Hartmann, Limburgerhof, and Albrecht Eckell, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed June 3, 1969, Ser. No. 830,092
Claims priority, application Germany, June 6, 1968, P 17 70 578.1
Int. Cl. C08f *15/38, 45/60*
U.S. Cl. 260—47 UA 8 Claims

Copolymers which do not become yellow at all or only become yellow after a long time and which are based on butadiene and/or carboxylic nitriles copolymerizable therewith and contain small amounts of a colored compound which absorbs light in the wavelength range from 570 to 605 millimicrons and which bears at least one copolymerizable group.

3,637,597

WATER DISPERSIBLE, CROSSLINKING RESINS VIA THE INCORPORATION OF PENDANT MANNICH ADDUCT UNITS THEREIN

George Jalics, Rocky River, Ohio, assignor to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Oct. 18, 1968, Ser. No. 768,924
Int. Cl. C08f 3/40, 27/08
U.S. Cl. 260—65 10 Claims

There is presented certain water dispersible polymers and coating compositions suitable for coating, impregnating, and electrocoating, and an improvement in process for producing the water dispersible polymers which comprises including in the polymer sufficient pendant Mannich adduct units for rendering the polymer dispersible in water. The pendant Mannich adduct units are represented by at least one of the following formulas:

$$\begin{matrix} R_1 \\ | \\ -CH-CH_2-N(Sec)HX \end{matrix} \quad \text{and} \quad \begin{matrix} O \\ \| \\ -C-CHR_2CH_2N(Sec)HX \end{matrix}$$

wherein R_1 represents a carboxyl, aldehyde, or carboxylic acid ester group, R_2 represents hydrogen, a halide, or lower alkyl radical, N(Sec) represents a lower alkyl, cycloaliphatic, aromatic, or heterocyclic secondary amine, and HX represents a salt-forming acid.

3,637,598

2-PYRROLIDONYL POLYACROLEIN

Nathan D. Field, Allentown, and David I. Randall, Easton, Pa., and Jimmie D. Fitzpatrick, Lafayette, La., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,072
Int. Cl. C08g 9/28
U.S. Cl. 260—72 R 2 Claims

A new composition of matter comprising 2-pyrrolidonyl polyacrolein.

3,637,599

METHOD OF PRODUCING POLYURETHANES AND SAID PRODUCT

James E. Ditty, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 827,090, May 12, 1969, which is a continuation of application Ser. No. 415,817, Dec. 3, 1964. This application Feb. 16, 1970, Ser. No. 10,083
Int. Cl. C08g 17/00
U.S. Cl. 260—75 NT 1 Claim

This invention relates to a method of preparing reaction mixtures comprising a reactive hydrogen containing polymeric material of about 500 to 6000 molecular weight and a mixture of about 1 to 35 parts of a polyaryl methane polyisocyanate of the formula

$$OCN—R—(CY_2—R'—NCO)_n$$

in which —R— and —R'— are arylene radicals, Y is selected from the group consisting of hydrogen, alkyl, and aryl radicals, n is a whole number having values of from about 1 to about 10 with at least a major percentage being the polyisocyanate, where n is at least 2, and the $—(CY_2—R'—NCO)$ groups in excess of one are attached to the preceding R' radical for each 100 parts of toluidine diisocyanate. This reaction mixture has unusual storage stable characteristics.

3,637,600

POLYIMIDE-AMIDES FROM REDUCED MALEOPIMARIC ACID

Walter H. Schuller and Ray V. Lawrence, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 15, 1970, Ser. No. 28,944
Int. Cl. C08g 20/32
U.S. Cl. 260—78 TF 3 Claims

This invention relates to the preparation of reduced maleopimaric acid from reduced fumaropimaric acid, the preparation of the acid chloride of reduced maleopimaric acid, and the reaction of the acid chloride with diamines to give polyimide-amides, useful for the preparation of films.

3,637,601

SULFUR-CONTAINING POLYAMIDE DYE RECEPTION PROMOTERS

William E. Truce, Lafayette, Ind., and Elizabeth G. Horvath, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Continuation of application Ser. No. 654,681, July 20, 1967. This application Jan. 22, 1970, Ser. No. 6,022
Int. Cl. C08g 20/20
U.S. Cl. 260—78 R 11 Claims

Sulfur-containing polyesters and polyamides are produced by reacting a mixed dianhydride of a dicarboxylic acid and a sulfonic acid with a glycol and/or a diamine or by reacting a dicarboxylic acid, a sulfonyl halide and a glycol and/or a diamine in the presence of a base. The sulfur-containing polyamides and polyesters are combined with conventional polyamides, polyesters, or polyolefins as dye reception promoters.

3,637,602

RESINS FROM PHENYLENE BISACRYLIC ACID

Anthony B. Conciatori, Chatham, N.J., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Filed Nov. 13, 1967, Ser. No. 682,584
Int. Cl. C08g 20/00
U.S. Cl. 260—78 3 Claims

An approximately equimolar quantity of an aromatic dicarboxylic acid possessing at least one non-aromatic side chain having a carbon to carbon double bond in conjugation with the aromatic nucleus, or an acid halide derivative thereof, is condensed with a primary or a secondary diamine to form a high melting polyamide resin. The polyamide resin possesses improved performance properties, and is particularly suited for use in the production of fibers, and as a vehicle or binder in the formation of high temperature resistant composite articles.

3,637,603

ALPHA-METHYLENEGLUTARIMIDE POLYMERS AND COPOLYMERS AND PREPARATION THEREOF

John M. Hoyt, Cincinnati, and Karl Koch, Norwood, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Filed Dec. 28, 1967, Ser. No. 694,048
Int. Cl. C08g 20/20
U.S. Cl. 260—78 UA 7 Claims

Homopolymers and copolymers of alpha-methyleneglutarimide and process for preparing same using heat alone or with a solvent or with a free radical source, which polymers can be employed to make fibers, foils and films.

3,637,604

SHAPED ARTICLES MADE FROM POLYCAPROLACTAMS CONTAINING AN ORGANOSILICON COMPOUND AS AN ANTIELECTROSTATIC AGENT

Joachim Schneider, Krefeld-Urdingen, Herbert Gröschel, Harry Kubitzek, and Günther Nawrath, Dormagen, and Hans Rudolph, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,369
Claims priority, application Germany, Dec. 28, 1967, P 16 94 235.1
Int. Cl. C08g 41/04, 47/10
U.S. Cl. 260—78 2 Claims

Shaped articles which are antielectrostatic and which are made from high molecular weight polycaprolactams

containing an organosilicon compound as an antielectrostatic agent.

3,637,605
OXIDE MAGNETS
Teruhiko Ojima and Gosaburo Nishi, Nagareyama-shi, Japan, assignors to TDK Electronics Company Ltd., Tokyo, Japan
Filed Sept. 4, 1969, Ser. No. 855,221
Claims priority, application Japan, Sept. 16, 1968, 43/66,081
Int. Cl. H01f 1/00
U.S. Cl. 252—62.59 1 Claim

An oxide magnet consisting primarily of BaO and Fe_2O_3, the molar ratio of BaO to Fe_2O_3 being between 1:5 and 1:6, and containing in addition 0.05 to 0.3% by weight CaO and 0.4 to 0.65% by weight of SiO_2, has large coercive force and high magnetic energy.

3,637,606
PROCESS FOR CHAIN TERMINATING POLY-(1,4-AMINO BENZOIC ACID)
Paul W. Morgan, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Jan. 22, 1969, Ser. No. 793,175
Int. Cl. C08g 20/04
U.S. Cl. 260—78 A 5 Claims

A process for chain terminating poly(1,4-benzamide) by using a preferred class of aromatic amino, hydrazino, and hydrazido carboxylic acids and derivatives, p-aminobenzoic acid being most preferred. An improved means of polymer stabilization is provided which permits the polymers, in the form of shaped articles, to undergo both a desirable increase in molecular weight and enhancement of physical properties.

3,637,607
SILICON-CONTAINING POLYAMIDE
Alvin D. Delman, Old Bethpage, Hanna N. Kovacs, Kew Gardens, and Bernard B. Simms, Franklin Square, N.Y., assignors to the United States of America as represented by the Secretary of the Navy
Filed Feb. 12, 1969, Ser. No. 798,640
Int. Cl. C08g 20/20
U.S. Cl. 260—78 R 2 Claims

Aromatic silicon-containing polyamides soluble in organic solvents and stable up to about 400° C., prepared by reaction of bis(p-chlorocarbonylphenyl) diphenylsilane and m-(or p-)phenylenediamine or by reaction of bis(p-carbopentachlorophenoxyphenyl) diphenylsilane and benzidine or by reaction of bis-p-carbo-(p-nitrophenoxy) phenyldiphenylsilane and benzidine. Solution-cast films from the polymers are flexible and show good adhesion to glass and metal surfaces.

3,637,608
METHOD OF REGULATING THE POLYMERIZATION RATE IN THE ANIONIC POLYMERIZATION OF LACTAMS
Siegfried Schaaf and Clau Berther, Chur, Grisons, Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung Zurich
No Drawing. Filed Sept. 25, 1969, Ser. No. 861,150
Claims priority, application Switzerland, Oct. 9, 1968, 15,078/68
Int. Cl. C08g 20/18
U.S. Cl. 260—78 L 7 Claims

The method relates to the polymerization of lactams having more than 6 member rings, at a temperature in the range of 130–180° C. An alkaline polymerization catalyst and a mixture of cocatalysts is employed in the polymerization reaction. The cocatalyst mixture consists of from 30–70% of a high-activity cocatalyst comprising acetyllactams, acid chlorides, acid anhydrides, cyanamides, isocyanates, ketenes, and oxazolidinedione derivatives, and the balance consisting of polycarbodiimides.

3,637,609
PREPARATION OF SODIUM POLYMALEATE
John H. Blumbergs, Highland Park, Joseph H. Finley, Metuchen, and John J. Rizzo, Trenton, N.J., assignors to FMC Corporation, New York, N.Y.
No Drawing. Filed June 1, 1970, Ser. No. 42,542
Int. Cl. C08f 27/04
U.S. Cl. 260—78.4 R 5 Claims

The sodium salt of poly(maleic acid), useful as a detergent builder, is prepared by hydrolyzing poly(maleic anhydride) with water at 60 to 80° C., and simultaneously adding the aqueous solution and a source of sodium oxide into a heel of water at pH 9.2 to 10.6, maintaining this pH throughout the addition, then bleaching the slurry, and recovering the salt.

3,637,610
MULTIFUNCTIONAL POLYMERIC ADDITIVE
Norman Jacobson, East Brunswick, N.J., assignor to Esso Research and Engineering Company
No Drawing. Continuation-in-part of application Ser. No. 664,925, Sept. 1, 1967. This application Feb. 25, 1970, Ser. No. 14,190
Int. Cl. C08f 27/08
U.S. Cl. 260—78.5 T 13 Claims

A hydrocarbon-oil-soluble polymeric additive having multifunctional qualities including viscosity-index-improving properties and sludge-dispersing properties is prepared by reacting an oil-soluble polymeric material, which contains acid or acid anhydride groups distributed along the polymer chain, with a heterocyclic amino compound under conditions which cause the formation of an amide or imide linkage between carboxyl or carboxyl anhydride groups of the polymer and the amino groups of the heterocyclic amino compound. The latter is characterized as a heterocyclic amino compound of the pseudo-aromatic type that has either oxygen or nitrogen in the ring, has only one group with an active amino hydrogen, contains no other active hydrogen groups, and has the amino group separated from the ring by from one to five carbon atoms.

3,637,611
NOVEL ALTERNATING COPOLYMER OF MULTI-SUBSTITUTED CONJUGATED VINYL COMPOUND AND UNSATURATED COMPOUND AND PROCESS FOR PRODUCING SAME
Kenji Takeya, Yoshihiro Uno, and Akira Yamane, Okayama, Japan, assignors to Sumitomo Chemical Company, Ltd., and Japan Exlan Company Ltd., both of Osaka, Japan
No Drawing. Filed Mar. 20, 1970, Ser. No. 21,475
Claims priority, application Japan, Mar. 26, 1969, 44/23,424
Int. Cl. C08f 1/28, 15/38, 19/16
U.S. Cl. 260—78.5 N 17 Claims

A novel alternating copolymer composed of the group (B) monomer consisting of at least one α-, β- or α,β-multisubstituted conjugated vinyl compound, and the group (A) monomer consisting of at least one monomer selected from the group of olefins, haloolefins, internal olefins, polyenes, acetylenes, and carbonyl compounds or thiocarbonyl compounds; the units from the group (A) monomer always alternating with the units from the group (B) monomer. Said alternating copolymer is produced by contacting at least the group (B) monomer of the two groups with an organoaluminum or organoboron halide to form a complex and then contacting the remaining monomer with the complex formed. When monomers of

both groups (A) and (B) are properly chosen, said novel alternating copolymer can be useful as a material for the production of film, fiber and molded articles, and as an additive for the plastics processing.

3,637,612
FAST CURING OF POLYSULFIDE POLYMERS
Eugene R. Bertozzi, Yardley, Pa., assignor to Thiokol Chemical Corporation, Bristol, Pa.
No Drawing. Filed Jan. 27, 1970, Ser. No. 6,329
Int. Cl. C08g *23/00*
U.S. Cl. 260—79 5 Claims

A process is disclosed for achieving an exceptionally fast room temperature cure of liquid polythiopolymercaptan polymers by using as a curing agent either the combination of an aqueous weak acid and a zinc compound selected from the oxide, peroxide, hydroxide and carbonate or an aqueous zinc salt of a weak acid.

3,637,613
POLYMERIZATION OF CYCLIC SULFIDES
Edwin J. Vandenberg, Foulk Woods, Del., assignor to Hercules Incorporated, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 374,171, June 10, 1964. This application Sept. 13, 1966, Ser. No. 578,999
Int. Cl. C08g *23/00, 23/14*
U.S. Cl. 260—79 5 Claims

Halogen-free organomagnesium compounds reacted with a polyreactive compound, such as a compound containing at least two active hydrogens as in water, ammonia, and resorcinol, are effective catalysts for the polymerization of episulfides. Crystalline polymers of episulfides are described.

3,637,614
SOLVENT SOLUBLE DRY SOIL RESISTANT FLUOROPOLYMERS
Edward J. Greenwood, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 803,093, Feb. 27, 1969. This application Aug. 19, 1969, Ser. No. 851,489
Int. Cl. C08f *15/40, 15/18*
U.S. Cl. 260—80.72 27 Claims

A fluorinated oil and water repellent and dry soil resistant copolymer having an inherent viscosity as a 0.5% solution in trichlorotrifluoroethane at 30° C. of from about 0.05 to 0.8 selected from units derived from monomers having the structure:

(I)

(a) $R_fCH_2CH_2O_2CCH{=}CH_2$,
(b) $R'O_2CC(CH_3){=}CH_2$, and optionally
(c) $R''O_2CC(CH_3){=}CH_2$,

wherein the sum of the weight of units derived from (b) and (c) is from about 15% to 35% by weight of the total copolymer or:

(II)

(a′) $R_fCH_2CH_2O_2CC(CH_3){=}CH_2$,
(b′) $R'O_2CCH{=}CH_2$, and optionally
(c′) $R''O_2CCH{=}CH_2$,

wherein the sum of the weight of units derived from (b′) and (c′) is from about 15% to 35% by weight of the copolymer; and wherein R_f is a perfluoroalkyl group having from 4 to 14 carbon atoms, R′ is an alkyl group having from 1 to 18 carbon atoms and R″ is a glycidyl group. The copolymers are useful in treating textile fabrics to render said fabrics oil and water-repellent and dry soil resistant and they form stable solvent solutions or dispersions.

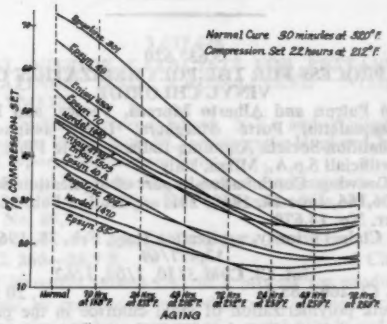
3,637,615
PRESSURE-SENSITIVE ADHESIVE
Alfred M. Coffman, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
No Drawing. Filed Sept. 19, 1969, Ser. No. 859,567
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.73 10 Claims

Pressure-sensitive adhesives having an excellent balance of adhesive and cohesive strength at elevated temperatures are provided by interpolymers of (1) a major proportion of an alkyl ester of acrylic acid wherein the alkyl group contains 4 to 8 carbon atoms, (2) lesser proportions of an N-alkyl-keto-acrylamide and (3) small amounts (a) of at least one of an N-alkylol amide of α,β-olefinically unsaturated carboxylic acids having from 4 to 10 carbon atoms, an N-substituted alkoxyalkyl acrylamide or methacrylamide and (b) at least one of an α,β-olefinically unsaturated carboxylic acid containing 3 to 6 carbon atoms and a monoolefinically unsaturated amide having at least one hydrogen on the amide nitrogen and olefinic unsaturation α,β the carbonyl group.

3,637,616
ETHYLENE COPOLYMERIZATION PROCESS
Robert E. A. Petersen, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 15, 1967, Ser. No. 660,687
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.78 11 Claims

In the copolymerization of ethylene with an α-olefin, such as propylene, in a solvent, e.g., n-hexane, reactor fouling due to high ethylene-content polymer formation can be reduced by feeding ethylene to the reactor both as a vapor and a liquid, the ratio of liquid propylene to liquid ethylene maintained high enough to form solvent-soluble copolymer.

3,637,617
MINIMIZING COMPRESSION SET OF CURABLE RUBBERS
Kenneth H. Wirth, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.
Filed Sept. 8, 1969, Ser. No. 855,940
Int. Cl. C08f *15/04*
U.S. Cl. 260—80.78 8 Claims



The method for reducing compression set of curable elastomeric materials comprising heating the cured elastomer to a temperature within the range of 200° to 400° F. for a time within the range of more than 72 hours at

212° F. to more than 1 hour at 400° F. and in which the cured elastomer is preferably an EPDM rubber having at least five C=C groups per 1000 carbon atoms before cure.

3,637,618

UNSATURATED POLYESTERS FROM EPOXIDES AND ETHYLENICALLY UNSATURATED MONOCARBOXYLIC ACID MIXED WITH SOLID EPOXIDE RESIN

Clayton A. May, Orinda, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 764,957, Oct. 3, 1968, which is a continuation-in-part of application Ser. No. 411,138, Nov. 13, 1964. This application Mar. 11, 1970, Ser. No. 18,696

Int. Cl. C08g *45/04*

U.S. Cl. 260—837 R 13 Claims

New curable polyester compositions having controlled viscosity which eliminate surface tack and which impart improved chemical resistance to glass reinforced structures are disclosed. These compositions comprise a mixture of (A) a soluble, curable unsaturated polyester of (1) a normally liquid polyepoxide and (2) an ethylenically unsaturated organic carboxylic acid and (B) a dissimilar normally solid polymeric material possessing a plurality of epoxy groups. Also disclosed are the above-defined compositions containing an ethylenically unsaturated monomer, such as styrene.

3,637,619

PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE

Corrado Mazzolini, Mestre, Sergio Lo Monaco, Vicenza, Luigi Patron and Alberto Moretti, Venice, and Marcello Di Ciolo, Treviso, Italy, assignors to Chatillon-Società Anonima Italiana per le Fibre Tessili Artificiali S.p.A., Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 811,576, Mar. 28, 1969. This application Feb. 26, 1970, Ser. No. 14,642

Claims priority, application Italy, Feb. 28, 1969, 13,475/69, 13,476/69

Int. Cl. C08f *3/30, 1/62, 1/04*

U.S. Cl. 260—85.5 24 Claims

Bulk polymerization of vinyl chloride in the presence of a catalytic system comprising an organic hydroperoxide, an alcoholate of an alkali metal and an organic sulphite or a sulphinic acid wherein the polymerization is conducted at a temperature higher than 0° C.

3,637,620

PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE

Luigi Patron and Alberto Moretti, Venice, and Renato Pasqualetto, Porto Marghera, Italy, assignors to Chatillon-Società Anonima Italiana per le Fibre Tessili Artificiali S.p.A., Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 836,166, June 24, 1969. This application Feb. 26, 1970, Ser. No. 14,670

Claims priority, application Italy, Feb. 28, 1969, 13,477/69

Int. Cl. C08f *3/30, 1/04, 1/62*

U.S. Cl. 260—85.5 20 Claims

Bulk polymerization of vinyl chloride in the presence of a catalytic system consisting essentially of an organic hydroperoxide activated by an alcoholic solution of sulphur dioxide and at least one oxide or hydroxide of an alkali metal or of magnesium or magnesium sulphite, wherein the polymerization process is conducted continuously or semi-continuously at a temperature higher than 0° C.

3,637,621

PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE

Sergio Lo Monaco, Vicenza, Corrado Mazzolini, Mestre, Luigi Patron, Sestriere, and Alberto Moretti, Venice, Italy, assignors to Chatillon Società Anonima Italiana per le Fibre Tessili Artificiali S.p.A., Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 784,191, Dec. 16, 1968. This application Feb. 26, 1970, Ser. No. 14,671

Claims priority, application Italy, Dec. 19, 1967, 24,081/67

Int. Cl. C08f *1/04, 1/62, 3/30*

U.S. Cl. 260—85.5 15 Claims

Bulk polymerization of vinyl chloride in the presence of a catalytic system comprising an organic hydroperoxide and a salt of a mono-ester of sulphurous acid having the general formula:

$$(R-O-\overset{O}{\overset{\|}{S}}-O)_nMe$$

in which R is an alkyl, cycloalkyl or aryl radical having from 1 to 12 carbon atoms, Me is a metal of the first or second group of the Periodic System or aluminum and *n* is 1, 2 or 3 depending on the valency of Me, wherein the polymerization is conducted continuously or semi-continuously at a temperature higher than 0° C.

3,637,622

PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE

Sergio Lo Monaco, Milan, Corrado Mazzolini, Mestre, and Luigi Patron and Alberto Moretti, Venice, Italy, assignors to Chatillon Società Anonima Italiana per le Fibre Tessili Artificiali S.p.A., Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 784,191, Dec. 16, 1968. This application July 22, 1970, Ser. No. 57,305

Claims priority, application Italy, July 31, 1969, 20,357/69

Int. Cl. C08f *1/04, 1/61, 3/30*

U.S. Cl. 260—85.5 5 Claims

A process is disclosed for the low temperature bulk polymerization of vinyl chloride by using, as catalyst, a catalytic system consisting essentially of an organic hydroperoxide and an ammonium salt of the general formula:

$$R'-O-\overset{O}{\overset{\|}{S}}-O-X$$

wherein

R′ is an alkyl, cyclo-alkyl, aryl or aryl-alkyl radical having from 1 to 12 carbon atoms, and

X is a radical containing quaternary nitrogen

Preferably R′ is an alkyl radical having from 1 to 4 carbon atoms, and

X is NH_4 or NR_4'', R″ being an alkyl radical having from 1 to 4 carbon atoms.

3,637,623

POLYMERIZATION OF VINYL CHLORIDE IN BULK AND AT LOW TEMPERATURES

Sergio Lo Monaco, Vicenza, Corrado Mazzolini, Mestre, and Luigi Patron and Alberto Moretti, Venice, Italy, assignors to Chatillon Società Anonima Italiana per le Fibre Tessili Artificiali S.p.A., Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 671,216, Sept. 28, 1967. This application Feb. 27, 1970, Ser. No. 15,217

Claims priority, application Italy, Sept. 19, 1969, 22,250/69

Int. Cl. C08f *1/04, 1/61, 3/30*

U.S. Cl. 260—85.5 15 Claims

Vinyl chloride is polymerized in bulk and at low temperatures in the presence of a lower mercaptan utilizing a

polymerization catalyst comprised of an organic hydroperoxide, sulphur dioxide and an alcoholate of a Group I metal of the Periodic Table, the molar ratio of the difference between the concentrations in moles of the said alcoholate and the SO_2 to the concentration in moles of the said hydroperoxide being greater than 0 but less than about 0.5.

3,637,624

POLYMERIZATION OF VINYL CHLORIDE IN BULK

Sergio Lo Monaco, Vicenza, Corrado Mazzolini, Mestre, and Luigi Patron and Alberto Moretti, Venice, Italy, assignors to Chatillon Società Anonima Italiana per le Fibre Tessili Artificiali S.p.A., Milan, Italy

No Drawing. Continuation-in-part of applications Ser. No. 671,216, Sept. 28, 1967, and Ser. No. 885,293, Dec. 15, 1969. This application Feb. 27, 1970, Ser. No. 15,218

Claims priority, application Italy, Feb. 28, 1969, 13,473/69

Int. Cl. C08f *1/04, 1/61, 3/30*

U.S. Cl. 260—85.5 **15 Claims**

Vinyl chloride is polymerized in bulk utilizing a polymerization catalyst comprised of an organic hydroperoxide, sulphur dioxide and an alcoholate of a Group I or II metal of the Periodic Table, or of aluminum, said alcoholate having from 1 to 6 carbon atoms, by conducting the polymerization at temperatures ranging from between 0° C. and about 100° C. and according to a continuous or semi-continuous process, with the gradual addition of the components of the catalytic system to the monomer.

3,637,625

LOW TEMPERATURE POLYMERIZATION OF VINYL CHLORIDE IN THE PRESENCE OF A REDOX CATALYST

Robert Buning, Oberlar, Karl-Heinz Diessel, Nienburg, and Gerhard Bier, Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

No Drawing. Filed May 15, 1968, Ser. No. 729,426

Claims priority, application Germany, June 22, 1967, P 17 20 481.8

Int. Cl. C08f *3/30, 15/08*

U.S. Cl. 260—85.5 **5 Claims**

Homo and copolymerization of vinyl chloride with or without comonomers at about −8 to −50° C. in the presence of ascorbic acid, heavy metal salts and a combination of hydrogen peroxide and cyclohexanesulfonylacetyl peroxide as a redox system polymerization catalyst.

3,637,626

PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE

Corrado Mazzolini, Sergio Lo Monaco, Luigi Patron, and Alberto Moretti, Mestre, and Marcello Di Ciolo, Treviso, Italy, assignors to Chatillon Società Anonima Italiana per le Fibre Tessili Artificiali S.p.A., Milan, Italy

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,576

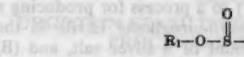
Claims priority, application Italy, Apr. 3, 1968, 14,761/68; May 6, 1968, 16,142/68

Int. Cl. C08f *3/30, 1/62*

U.S. Cl. 260—85.5 **19 Claims**

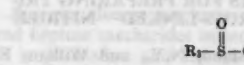
This application relates to a process for obtaining highly syndiotactic, white, and heat-stable polyvinylchloride particularly suitable for being transformed into fibers by the low temperature bulk-polymerization of vinyl chloride, the polymerization being conducted in the presence of a catalytic system comprising an organic hydroperoxide, an alcoholate of an alkali metal in which the alkyl radical may have a linear or branched chain having from 1 to 6 carbon atoms (or, instead of the alkali metal alcoholate, an alkali metal hydroxide in solution in a linear or branched chain alcohol having from 1 to 5 carbon atoms) and:

(a) an organic sulphite of the general formula:



wherein R_1 and R_2 may be, independently of each other, either a simple or substituted, linear or branched alkyl radical or a cycloalkylic radical such radicals having from 1 to 12 carbon atoms; or

(b) a sulphinic acid of the general formula:



or one of its esters, in which R_3 may be a simple or substituted linear or branched alkyl radical, or a cycloalkyl- or aryl-radical such radicals having from 1 to 12 carbon atoms.

3,637,627

OLEFIN POLYMERS AND METHOD FOR PRODUCING SAME

James N. Short, Robert P. Zelinski, Rudolf H. Gaeth, and Ernest A. Zuech, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed May 3, 1967, Ser. No. 635,708

Int. Cl. C08f *1/56, 15/04*

U.S. Cl. 260—88.2 **18 Claims**

Acyclic olefinic monomers containing 3 to about 20 carbon atoms per molecule are converted into ethylene-propylene copolymers by contact with a catalyst system comprising a coordination complex of a transition metal or a transition metal inorganic compound associated with a difficultly reducible metal oxide or phosphate; a Group IV–B or V–B metal compound; and an organoaluminum dihalide or organoaluminum sesquihalide.

3,637,628

METAL NITRIDE CATALYSTS FOR PREPARING TRIAZINES AND CROSS-LINKED NITRILE POLYMERS

Edwin Dorfman, Grand Island, N.Y., and William E. Emerson, Barrington, Ill., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 634,866, May 1, 1967. This application Nov. 12, 1970, Ser. No. 89,101

Int. Cl. C08f *3/74*

U.S. Cl. 260—88.7 E **5 Claims**

This invention relates (A) to a process for producing a triazine by reaction of a perfluoroalkane nitrile in the presence of a catalytic amount of a metal nitride and (B) the cross-linking of a polymer or copolymer containing at least greater than an average of one cyanohaloalkyl group on the chain of the polymer or copolymer, to form a cross-linked polymer or copolymer, in the presence of a metal nitride.

3,637,629
SILVER SALT CATALYSTS FOR PREPARING TRIAZINES AND CROSS-LINKED NITRILE POLYMERS

Edwin Dorfman, Grand Island, N.Y., and William E. Emerson, Barrington, Ill., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 634,867, May 1, 1967. This application Nov. 12, 1970, Ser. No. 89,107

Int. Cl. C08f *3/74*

U.S. Cl. 260—88.7 E **9 Claims**

This invention relates (A) to a process for producing a triazine by reaction of a perfluoroalkane nitrile in the presence of a catalytic amount of a silver salt, and (B) the cross-linking a polymer or copolymer containing greater than the average of one cyanohaloalkyl group per molecule of the polymer or copolymer, to form a cross-linked polymer or copolymer, in the presence of a silver salt.

3,637,630
FLUORIDE CATALYSTS FOR PREPARING TRIAZINES AND CROSS-LINKED NITRILE POLYMERS

Edwin Dorfman, Grand Island, N.Y., and William E. Emerson, Barrington, Ill., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 634,893, May 1, 1967. This application Nov. 12, 1970, Ser. No. 89,106

Int. Cl. C08f *3/74*

U.S. Cl. 260—88.7 E **10 Claims**

This invention relates (A) to a process for producing, preferably at low reaction temperatures, a triazine at high levels of conversion and yield from a haloalkane nitrile such as perfluoroalkane nitriles by the employment of a catalytic amount of a fluoride catalyst of members selected from the group consisting of the Periodic Table Groups I, II–B, III, IV, V–B, VI, VII, VIII, ammonium, hydrates thereof, and fluoride mixtures of said members, and also (B) to the employment of the above-described catalyst in a catalytic amount with a polymer or copolymer containing at least greater than an average of one cyanohaloalkyl group on the chain of a polymer or copolymer, to form a cross-linked polymer or copolymer.

3,637,631
HOMOPOLYMERIZATION OF VINYL FLUORIDE TO ORIENTABLE POLYVINYL FLUORIDE IN A MEDIUM CONTAINING TERTIARY BUTYL ALCOHOL

Dario Sianesi and Gerardo Caporiccio, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Apr. 8, 1969, Ser. No. 814,431

Claims priority, application Italy, May 10, 1965, 10,491/65

Int. Cl. C08f *3/22*

U.S. Cl. 260—92.1 **6 Claims**

There is disclosed herein an improved process for polymerizing vinyl fluoride to orientable polyvinyl fluoride. The orientable homopolymer is obtained by polymerizing vinyl fluoride in tert. butyl alcohol as liquid medium, and in contact with radical initiators under practical temperature and pressure conditions.

3,637,632
SHORTSTOPPING FREE RADICAL POLYMERIZATION OF VINYLIDENE MONOMERS

Lee Traynor, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed June 1, 1970, Ser. No. 42,571

Int. Cl. C08f *1/82, 3/30*

U.S. Cl. 260—92.8 A **10 Claims**

The free radical polymerization of vinylidene monomers is effectively terminated by adding to a polymerization mixture thiosemicarbazide or thiosemicarbazone derivatives thereof. These short-stops are particularly effective in the polymerization of vinyl halides with organic peroxy catalysts and result in stable uniform polymers.

3,637,633
PEROXY COMPOUNDS

David Rodney Dixon and John Andrew Cunningham, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Apr. 15, 1969, Ser. No. 816,409

Claims priority, application Great Britain, Apr. 24, 1968, 19,427/68

Int. Cl. C08f *3/30, 1/60*

U.S. Cl. 260—92.8 W **6 Claims**

A mixture of a diacyl peroxide, a peroxydicarbonate, and an acyl peroxycarbonate is made by the action of an inorganic peroxide on a mixture of a chloroformate and an acid chloride. The mixture of peroxy compounds can be used as catalysts for the polymerisation of vinyl chloride.

3,637,634
METHOD FOR NUCLEATING ALPHA-OLEFIN POLYMERS

Paul Joseph Marinaccio, Monroe, Conn., and Joseph Matthew Kelley, Westfield, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

No Drawing. Filed Mar. 13, 1968, Ser. No. 712,587

Int. Cl. C08f *27/00*

U.S. Cl. 260—93.7 **4 Claims**

The nucleation of crystalline polypropylene is accomplished by employment of a masterbatch prepared by dissolving sodium benzoate in water, precipitating the benzoate by addition of an alcohol to form a gel, adding to the gel from 50 to 75% by weight finely divided polypropylene and drying the resulting masterbatch.

3,637,635
TREATMENT OF RUBBERY POLYMERS WITH LEWIS ACIDS

Ernest J. Buckler, Hugh K. Coulthart, Nathan J. McCracken, and Mieczyslaw Marcinkowski, Sarnia, Ontario, Canada, assignors to Polymer Corporation Limited, Sarnia, Ontario, Canada

No Drawing. Filed Jan. 27, 1964, Ser. No. 340,546

Int. Cl. C08d *5/00, 5/02, 5/04*

U.S. Cl. 260—94.7 R **7 Claims**

1. A process of modifying a substantially gel-free rubbery polymer of butadiene prepared in the presence of a Ziegler catalyst and having at least 75% of the butadiene units in the cis-1,4 configuration which comprises treating said polymer of butadiene having a Mooney viscosity of about 10 to 70, while dispersed in an inert organic liquid, with between 0.3 and 5% by weigth of the butadiene polymer of a Lewis acid selected from the group consisting of hydrogen chloride, aluminum trichloride, titanium tetrachloride and a product of incomplete stopping of a polymerization catalyst comprising a cobalt salt and an organo-aluminum chloride, with less than equimolar amount of a catalyst stopper, to produce a substantially gel-free modified polymer of butadiene having a Mooney viscosity which is at least Mooney points higher than that of the unmodified polymer.

3,637,636
ETHYLENE POLYMERIZATION IN THE PRESENCE OF COMPLEX NICKEL CATALYSTS CONTAINING BENZOIC ACID DERIVATIVE LIGANDS

Ronald Bauer, Orinda, and Harold Chung, Lawrence George Cannell, and Wilhelm Keim, Berkeley, Calif., and Henry van Zwet, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Jan. 15, 1970, Ser. No. 3,191

Int. Cl. C08f *3/06, 1/58*

U.S. Cl. 260—94.9 C **15 Claims**

Ethylene is polymerized in the presence of a catalyst which is the reaction product of a nickel compound

with a benzoic acid derivative ligand substituted with one or more substituents selected from the group consisting of —SH, —CN, —$N(R^1)(R^2)$, —OR^3 and alkyl of up to 8 carbon atoms; R^1, R^2 and R^3 can be hydrogen or alkyl of up to 8 carbon atoms with the proviso that at least one of the substituents is

—SH, —CN, —$N(R^1)(R^2)$ or —OR^3

The nickel compounds comprise olefinically unsaturated compounds of from 2 to 20 carbon atoms. The preferred nickel compound is bis-cyclooctadiene-1,5-nickel.

3,637,637

PROCESS FOR THE POLYMERIZATION OF ETHYLENE

Pietro Saccardo, Milan, Gianni Trada, Gozzano, Maurizio Galastri, Sesto San Giovanni, Milan, and Jean Herzenberg, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 387,785, Aug. 5, 1964. This application Sept. 14, 1967, Ser. No. 667,678

Claims priority, application Italy, Aug. 9, 1963, 16,878/63

Int. Cl. C08f *1/66, 3/06*

U.S. Cl. 260—94.9 D 11 Claims

A process for the polymerization of ethylene carried out in the presence of a catalytic system obtained by reacting chromyl fluoride with a carrier containing silicon compounds.

3,637,638

RESINS FROM MALEOPIMARIC ACID AND PRIMARY AMINES

Martin F. Sloan, Brandywood, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 710,756, Mar. 6, 1968. This application May 28, 1970, Ser. No. 41,644

Int. Cl. C09f *1/04, 1/06*

U.S. Cl. 260—102 9 Claims

Novel resinous compounds useful in manufacture of printing inks are prepared from maleopimaric acid and primary amines.

3,637,639

RESIN EXTRACTION PROCESS

Francis R. Zinniel, 1182 Westwood Drive, San Jose, Calif. 95125, Eugene R. Blome, San Jose, Calif., and Philip D. Kimball, Long Lake, Minn.; said Blome and Kimball assignors to said Zinniel

Filed Oct. 28, 1968, Ser. No. 771,125

Int. Cl. C09f *1/00*

U.S. Cl. 260—107 19 Claims

A continuous process for the extraction from resin-containing coal, of substantially all of the contained resin. The process provides for subjecting resin-containing coal fines to an integrated solvent-extraction and solution-separation procedure for obtaining both a first quantity of resin solution containing a major portion of the resin, and a mixture of coal fines and solution containing substantially all of the remaining portion of the resin; subjecting the mixture to a series of integrated solvent-dilution and solution-separation procedures for obtaining both a second quantity of resin solution containing substantially all of the remaining portion of the resin and a residual mixture of coal fines and solvent, recovering substantially all of the resin contained in the first and second quantities of solution; and recovering substantially all of the solvent employed.

3,637,640

ORGOTEIN STABILIZED WITH SACCHARIDE, PROCESS AND PRODUCTS

Wolfgang Huber, San Francisco, Calif., assignor to Diagnostic Data, Inc., Palo Alto, Calif.

Continuation-in-part of application Ser. No. 657,971, Aug. 2, 1967. This application May 4, 1970, Ser. No. 34,006

Int. Cl. C07g *7/04*

U.S. Cl. 260—115 17 Claims

Sucrose, glucose, mannose, and certain pentose, hexose and heptose saccharides improve the stability of orgotein to lyophilization and storage. Orgotein is the name assigned by USCAN to an isolated, substantially pure, soluble, globular, non-toxic and substantially non-antigenic metalloprotein having anti-inflammatory and other pharmacodynamic activity.

3,637,641

METHOD OF TREATING POST-TRAUMATIC ARTHRITIS

Wolfgang Huber, San Francisco, and Thomas L. Schulte, Woodside, Calif., assignors to Diagnostic Data, Inc., Palo Alto, Calif.

No Drawing. Continuation-in-part of application Ser. No. 576,454, Aug. 31, 1966, which is a continuation-in-part of application Ser. No. 494,048, Oct. 8, 1965, both now abandoned. This application Jan. 16, 1970, Ser. No. 3,518

Int. Cl. A61k *27/00*

U.S. Cl. 424—177 9 Claims

The pain and structural abnormalities associated with post-traumatic arthritis are alleviated by systemic administration of orgotein to the patient affected with the arthritic condition.

3,637,642

PROCESS FOR DISSOLVING INSOLUBLE COLLAGEN EMPLOYING A MIXTURE OF AN ALKALI METAL HYDROXIDE, AN ALKALI METAL SULFATE, AND AN AMINE

Tadahiko Fujii, Tokyo, Japan, assignor to Nihon Hikaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Continuation of application Ser. No. 758,685, Sept. 10, 1968. This application Mar. 20, 1970, Ser. No. 19,553

Claims priority, application Japan, Sept. 16, 1967, 42/59,201

Int. Cl. C09h *1/00, 1/04, 3/00*

U.S. Cl. 260—118 8 Claims

A process for dissolving insoluble collagen in an aqueous medium in which insoluble collagen is treated with an aqueous solution containing alkali metal hydroxide, alkali metal sulfate and a small amount of a lower primary or secondary amine and then, after desalting, treated with an acid solution of a pH less than 4.0.

3,637,643

PROTEIN SEPARATION FROM WHEY USING A SOLUBILIZED PHOSPHATE

Winston Harold Wingerd, Elgin, Ill., assignor to Borden Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 745,142, July 16, 1968, which is a continuation-in-part of application Ser. No. 486,524, Sept. 10, 1965, which in turn is a continuation-in-part of application Ser. No. 395,562, Sept. 10, 1964. This application Feb. 2, 1970, Ser. No. 7,974

Int. Cl. A23j *1/20*

U.S. Cl. 260—122 4 Claims

This invention relates to the method of separating proteins in undenatured form from a crude source thereof by first reducing the ratio of divalent cations to actual protein in the source to no more than about 1 part by weight of divalent cations to 35 parts by weight of actual protein followed by admixing with said source a solubilized phosphate composition consisting essentially of one part by weight of a potassium polymetaphosphate and from about 5 to about 15 parts of a sodium phosphate, and to the resulting products. The invention has particular reference to the separation of lactalbumin from whey and to the resulting products.

3,637,644

AZONIA DIAZO KETONES

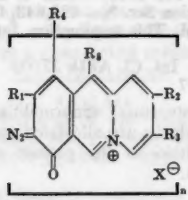
Kenneth R. Dunham, Donald L. Fields, Douglas G. Borden, and Jerry B. Miller, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Mar. 8, 1967, Ser. No. 621,469, now Patent No. 3,526,503, dated Sept. 1, 1970. Divided and this application Nov. 13, 1969, Ser. No. 871,287

Int. Cl. C07c *113/04;* G03c *1/54*

U.S. Cl. 260—141 8 Claims

This invention concerns azonia diazo ketones having the following structure:



wherein $X^{\ominus}$ represents an anion such as a halide ion, a perchlorate ion, a tetrafluoroborate ion, or the like, *n* is a whole integer 1 or 2; R_1 and R_2 each represents a hydrogen atom, an alkyl (e.g. 1–8 carbon atoms), aralkyl, cycloalkyl, alkoxy or aryl group, said group optionally containing hetero atoms, or said group being optionally substituted; R_3 represents a hydrogen atom or the atoms necessary to complete an aromatic carbocyclic ring with R_2, said ring being optionally substituted; R_5 represents a hydrogen atom, alkyl groups or phenyl groups optionally substituted; and R_4, when $n=2$, represents an alkylene group or chemical bond and, when $n=1$, R_4 represents a hydrogen atom, an alkyl group (e.g. 1–8 carbon atoms), or an aryl group, and the use of these ketones in photoresist compositions and in lithography.

3,637,645

WATER-SOLUBLE PYRAZALINE DISAZO DYESTUFFS AND METAL COMPLEX COMPOUNDS THEREOF

Fritz Meininger and Hermann Fuchs, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

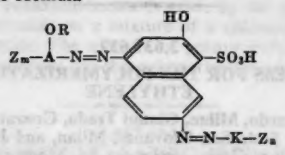
No Drawing. Filed Sept. 6, 1968, Ser. No. 758,105

Claims priority, application Germany, Sept. 9, 1967, P 16 44 228.7

Int. Cl. C09b *31/14, 45/24;* D06p *1/10*

U.S. Cl. 260—147 6 Claims

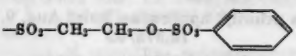
Water-soluble disazo-dyestuffs having in form of the free acid the formula

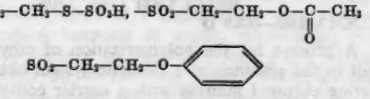


in which Z represents $-SO_2-CH=CH_2$,

$-SO_2-CH_2-CH_2-O-SO_3H$

$-SO_2-CH_2-CH_2-O-SO_3-CH_3$





$-SO_2-CH_2-CH_2-N$ (lower alkyl)$_2$ or

$-SO_2-CH_2-CH_2-Cl$

R represents hydrogen or lower alkyl, *m* and *n* represent integers from 0 to 2, the sum of *m* and *n* being at least 1 and at most 2, A represents the radical of a diazo component of the benzene and naphthalene series, and K represents the radical of a coupling component of the naphthalene, pyrazolone and aceto-acetylarylamide series, and the 1:1 copper complex compound or the 1:2-cobalt- or 1:2-chromium complex compounds thereof, said dyestuffs being suitable for the dyeing or printing of fibrous materials of native or regenerated cellulose, wool, silk, polyamides or polyurethanes, the dyeings and prints obtained on cellulose fibrous materials being of intense red-brown, dark brown, olive, grey (black) or navy blue shades and being distinguished by a very good fastness to light and to wet processing.

3,637,646

FIBER-REACTIVE PHTHALOCYANINESULFONAMIDOARYLAZO - STILBENYLPYRAZOLONE DYESTUFF

Gerd Hoelzle, Liestal, Switzerland, assignor to Ciba Limited, Basel, Switzerland

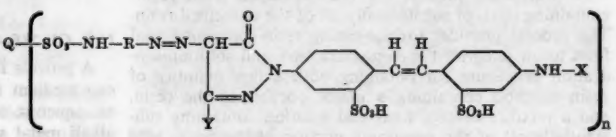
No Drawing. Filed Oct. 15, 1968, Ser. No. 767,820

Claims priority, application Switzerland, Oct. 24, 1967, 14,825/67; Sept. 9, 1968, 13,509/68

Int. Cl. C09b *29/38, 47/04;* D06p *1/38*

U.S. Cl. 260—147 15 Claims

Phthalocyanine dyestuffs of the formula



in which Q represents the residue of a phthalocyanine, *n* stands for a number between 1 and 2 inclusive, R repre-

sents a residue of the benzene series, X represents a fibre-reactive residue and Y represents a methyl, carbalkoxy or carboxyl group. Such compounds are valuable dyestuffs for dyeing especially cellulosic fibres brilliant green shades of good general fastness especially to light and wet treatment.

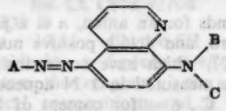
3,637,647

WATER-INSOLUBLE MONOAZO DYESTUFFS CONTAINING A QUINOLINE COUPLING COMPONENT

Konrad Opitz, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed June 3, 1970, Ser. No. 43,187
Claims priority, application Germany, June 11, 1969, P 19 29 573.9
Int. Cl. C09b *29/36*; D06p *1/02*
U.S. Cl. 260—155 **8 Claims**

A water-insoluble monoazo dyestuff of the formula



wherein A as a radical of a diazo component represents dichloro-phenylene, dinitro-phenylene, cyano-nitro-phenylene, chloro-nitro-phenylene, nitro-trifluoromethyl-phenylene, chloro-dinitro-phenylene, bromo-dinitro-phenylene, chloro-nitro-cyano-phenylene, bromo-nitro-carbomethoxy-phenylene, bromo-cyano-phenylene, methylsulfonyl-nitro-phenylene, dinitro-trifluoromethyl-phenylene or dinitro-carbomethoxy-phenylene, B represents hydrogen or lower alkyl, and C represents hydrogen, phenyl, lower alkyl-phenylene, chloro-phenylene, benzyl, cyclohexyl, hydroxy-ethyl, cyanoethyl, hydroxypropyl or n-butan-3-onyl, said dyestuff being suitable for the dyeing or printing of cellulose acetate or synthetic polyamide or polyester fibres, the dyeings or prints being distinguished by very good fastness properties to thermofixation, washing, rubbing, waste gas and light.

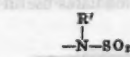
3,637,648

REACTIVE MONAZO-DYESTUFFS

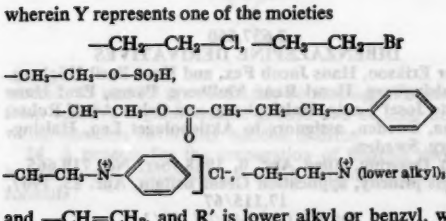
Rudolf Kühne and Fritz Meininger, Frankfurt am Main, and Heinrich Frölich, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Continuation-in-part of application Ser. No. 365,489, May 6, 1964. This application July 9, 1968, Ser. No. 743,275
Claims priority, application Germany, May 14, 1963, F 39,735
Int. Cl. C09d *29/38, 29/16*
U.S. Cl. 260—162 **6 Claims**

Reactive monoazo dyestuffs containing as reactive groupings one or two groups of the formula



wherein Y represents one of the moieties



and —CH=CH$_2$, and R' is lower alkyl or benzyl, which are suitable for the dyeing or printing of leather, wool, silk, textile materials of polyamides, polyactylonitrile, polyurethanes or cellulose.

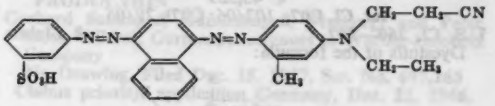
3,637,649

WATER-SOLUBLE PHENYL AZONAPHTHYL-AZOPHENYL

Fritz Meininger, Frankfurt am Main, and Ludwig Schlafer, Sulzbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,497
Claims priority, application Germany, Nov. 30, 1967, P 16 44 235.6
Int. Cl. C09b *31/04*; D06p *1/06*
U.S. Cl. 260—191 **1 Claim**

The water-soluble disazo-dyestuff of the formula



said dyestuff being suitable for the dyeing or printing of fibres, foils or fibres of wool, silk, polyamides, polyurethanes or leather, which dyeings are intense of a uniform Bordeaux red coloration and are very fast to light and to wet processing.

3,637,650

OXIDATION OF BIUREAS TO AZOBISFORMAMIDES

Arthur Doering, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Aug. 12, 1969, Ser. No. 849,510
Int. Cl. C07c *107/00*; C09b *27/00*
U.S. Cl. 260—192 **6 Claims**

Biureas are oxidized to azoamides, as a slurry in acetonitrile or aqueous acetonitrile, or other 2 to 6 carbon fatty acid nitrile, by heating in the presence of a 5 to 10% stoichiometric excess of concentrated nitric acid. Acetonitrile may be recovered from the reaction mixture simultaneously by distillation. For example, 1,6-di(n-butyl)biurea is oxidized to 1,1'-azobis(N-n-butylformamide).

3,637,651

ORTHO NITRATION OF THE PHENYL DIAZO COMPONENT OF AN AZO COMPOUND

Thomas Douglas Baron and Brian Ribbons Fishwick, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,426
Claims priority, application Great Britain, Nov. 7, 1967, 50,615/67
Int. Cl. C09b *43/04*
U.S. Cl. 260—207 **3 Claims**

Manufacture of disperse monoazo dyestuffs having at least one nitro group in ortho position to the azo group, which comprises treating the corresponding dyestuff containing a halogen atom in ortho position to the azo group with an alkali metal nitrite and a copper compound in a polar aprotic organic liquid.

3,637,652

DISPERSE MONOAZO DYESTUFFS

Brian Ribbons Fishwick, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

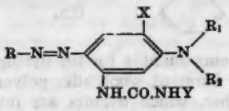
No Drawing. Continuation-in-part of abandoned application Ser. No. 308,681, Sept. 13, 1963. This application Mar. 23, 1966, Ser. No. 536,665
Claims priority, application Great Britain, Sept. 24, 1962, 33,487/62, 36,189/62, 36,190/62; Mar. 14, 1963, 10,164/63
Int. Cl. C09d *29/08*
U.S. Cl. 260—207.1 **7 Claims**

Disperse monoazo dyestuffs obtained by coupling a diazotised optionally substituted p-nitroaniline with a 3-formylamino-N:N-bis(carboalkoxyalkyl)aniline, and the

use of the said dyestuffs for coloring synthetic textile materials.

3,637,653
PHENYL-AZO-PHENYL DYESTUFFS
Hanswilli von Brachel, Offenbach am Main, Dieter Cornelius, Darmstadt-Arheilgen, and Eberhard Stier, Frankfurt am Main, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main, Germany
No Drawing. Filed Oct. 8, 1968, Ser. No. 765,983
Claims priority, application Germany, Oct. 13, 1967, C 43,559
Int. Cl. C07c 107/06; C07b 29/06
U.S. Cl. 260—207 2 Claims

Dyestuffs of the formula:



wherein R is the residue of a diazo component of a benzene or heterocyclic series free of water solubilizing substituent groups, R_1 and R_2 are aliphatic substituents, Y is an aliphatic or aromatic substituent and X is hydrogen or aliphatic and the utility thereof particularly in dyeing and printing of synthetic textile materials.

3,637,654
PURIFICATION OF ERYTHROMYCIN THIOCYANATE
Gerald George Post, Kenosha County, Wis., assignor to Abbott Laboratories, North Chicago, Ill.
No Drawing. Filed Apr. 3, 1969, Ser. No. 813,327
Int. Cl. C07c 47/18
U.S. Cl. 260—210 E 4 Claims

Erythromycin thiocyanate can be purified effectively and its potency can be increased significantly by treating it with trichloroethylene.

3,637,655
METHOD FOR EXTRACTING WATER-SOLUBLE SUBSTANCES FROM BIOLOGICAL MATERIALS
John R. Clendenning, Washington, D.C., assignor to Hazleton Laboratories, Inc., Falls Church, Va.
No Drawing. Continuation-in-part of application Ser. No. 433,488, Feb. 19, 1965. This application Sept. 1, 1967, Ser. No. 664,945
Int. Cl. C07d 51/54, 55/62
U.S. Cl. 260—211.5 R 8 Claims

In a method for determining the quantity of adenosine triphosphate (ATP) in a sample containing biological cells, for example, by reacting ATP with luciferin and luciferase and detecting the light emitted, the invention comprising mixing dimethyl sulfoxide and the sample, preferably in the presence of H_2O, thereby extracting ATP from the biological cells.

3,637,656
PREPARATION OF STARCH DERIVATIVES
Felix Joseph Germino, Palos Park, and Joseph Ronald Caracci, Chicago, Ill., assignors to CPC International Inc.
No Drawing. Filed Oct. 28, 1968, Ser. No. 771,295
Int. Cl. C08b 19/01
U.S. Cl. 260—233.3 R 6 Claims

Starch derivatives are produced without the use of gel-retarding salts by forming a mixture of 10–40 percent by weight starch in water, adding to the mixture, a reagent, and derivatizing the starch by reacting it with the reagent at temperatures between about 225°–400° F. The derivatization reaction effected, is substantially homogeneous and may be carried out in a continuous process if desired.

3,637,657
ALUMINUM COMPLEX OF SULFATED POLYSACCHARIDE AND PROCESS FOR THE PREPARATION THEREOF
Eiji Morii and Tadasuke Numasawa, Nagoya, Kouichi Iwata, Chita-gun, Shoichi Yamagata and Akira Ishimori, Sendai-shi, and Hiromi Hanai, Nagoya, Japan, assignors to Meito Sangyo Kabushiki Kaisha, Nagoya, Japan
No Drawing. Filed Mar. 28, 1969, Ser. No. 811,575
Claims priority, application Japan, Apr. 1, 1968, 43/20,964; Aug. 1, 1968, 43/53,904; Aug. 13, 1968, 43/57,146
Int. Cl. C07c 49/18, 69/32
U.S. Cl. 260—234 R 2 Claims

Aluminum complex of sulfated polysaccharide which exhibits an anti-peptic ulcer activity when orally administered, and which is a complex of water-soluble salts of sulfated polysaccharide and basic aluminum salts of the formula

$$Al_{2+n}(OH)_{3n}X_y$$

(wherein X stands for an anion, n is a positive number greater than zero, and y is a positive number equalling 6/valency of X), which have an intrinsic viscosity $[\eta]$ of 0.02–1.30 as measured in 1 N aqueous caustic soda solution at 25° C., a sulfur content of 10±1–20% by weight, and an aluminum content of 2–12% by weight; and a process for the preparation thereof.

3,637,658
PROCESSING RDX AND HMX
Sam B. Wright and Julius T. Rogers, Kingsport, Tenn., assignors to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Nov. 26, 1968, Ser. No. 779,262
Int. Cl. C07d 55/16, 55/60
U.S. Cl. 260—239 HM 3 Claims

Recovery of HMX in good concentrations is achieved from RDX-HMX admixtures by preferential crystal growth of RDX in spent acid and subsequent separation of the fine crystals of HMX by physical methods. The spent acid will normally comprise 60 to 86% acetic acid, 1 to 2% nitric acid, 1 to 3% formic acid and 1 to 2% ammonium nitrate.

3,637,659
ARALKYL PENTA- AND HEXAMETHYLENIMINE
Janis Plostnieks, Philadelphia, Pa., assignor to McNeil Laboratories, Inc.
No Drawing. Continuation-in-part of abandoned application Ser. No. 717,363, Mar. 29, 1968. This application Feb. 17, 1969, Ser. No. 799,943
Int. Cl. C07d 29/16, 29/24, 41/04
U.S. Cl. 260—239 B 14 Claims

The compounds are of the class of aralkyl penta- and hexamethylenimines which are useful as anti-arrhythmic agents; and to certain intermediates useful in the syntheses of such methylenimines.

3,637,660
DIBENZAZEPINE DERIVATIVES
Edgar Eriksoo, Hans Jacob Fex, and Knut Beril Högberg, Halsingborg, Henri René Mollberg, Paarp, Paul Hans Otto Josef Kneip, Halsingborg, and Oskar Adolf Rohte, Raa, Sweden, assignors to Aktiebolaget Leo, Halsingborg, Sweden
No Drawing. Filed Apr. 8, 1968, Ser. No. 719,665
Claims priority, application Great Britain, Apr. 13, 1967, 17,115/67
Int. Cl. C07d 41/08, 93/14
U.S. Cl. 260—239 31 Claims

Heterocyclic aminoketones wherein the heterocyclic moiety is phenothiazin-10-yl, 5H-dibenz(b,f)-azepin-5-yl,

or 10,11-dihydro - 5H - dibenz(b,f)-azepin-5-yl and the aminoketone moiety is

propyl-N-lower-alkyl-N-$(CH_2)_nCOR^3$

wherein *n* is 1–3 and R^3 is a phenyl, thienyl, furyl, or pyrryl group with optional substituents, the compounds having para-sympatholytic, sympathomimetic, and sedative activity useful in the treatment of central nervous system disorders, especially endogenic depressions, compositions thereof, and a method of treating therewith.

3,637,661

10-HYDROXY-10,11-DIHYDRO-DIBENZAZEPINE DERIVATIVE

Walter Schindler, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,551
Int. Cl. C07d *41/08*
U.S. Cl. 260—239 D **1 Claim**

10 - hydroxy - 10,11 - dihydro-5H - dibenz[b,f]azepine-5-carboxamide has a depressant effect on the central nervous system; the compound is the active ingredient of pharmaceutical compositions and is useful for the treatment of psychosomatic disturbances, of epilepsy and of trigeminal neuralgia.

3,637,662

1-[2-(PHENYL)-LOWER-ALKYL]-AZIRIDINES

Raj K. Razdan, Belmont, Mass., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Continuation-in-part of abandoned application Ser. No. 640,815, May 24, 1967. This application Mar. 25, 1970, Ser. No. 22,668
Int. Cl. C07d *45/00, 99/04*
U.S. Cl. 260—239 E **4 Claims**

1-[2-(3,4,5-trimethoxyphenyl)ethyl]aziridine, 1-[1-(3,4,5-trimethoxyphenyl)-2-propyl]aziridine and 1-[1(2-methoxy - 4,5-methylenedioxyphenyl)-2-propyl]-aziridine are prepared from the appropriate vinyl-substituted benzene and ethylenimine. The compounds are useful as mild incapacitating agents.

3,637,663

FLUORINE-CONTAINING DIAZIRINES

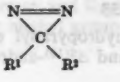
Ronald A. Mitsch, Falcon Heights, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of applications Ser. No. 188,926, Apr. 16, 1962, and Ser. No. 196,859, May 21, 1962. This application Sept. 9, 1963, Ser. No. 307,730
Int. Cl. C07d *45/00*
U.S. Cl. 260—239 AA **24 Claims**

1. A compound having up to 18 carbon atoms of the formula:

wherein R^1 and R^2 are covalently bonded substituents free from reactive organometallic groups and at least one of which contains covalently bonded fluorine.

24. A process for the preparation of fluorine containing diazirines containing up to 18 carbon atoms of the formula:



wherein R^1 and R^2 are covalently bonded substituents free from reactive organometallic groups and at least one of which contains covalently bonded fluorine, which comprises reacting a compound which contains at least two —NF— groups attached to a single carbon atom with a reducing agent at a temperature of from about 0° to 50° C.

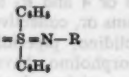
3,637,664

N-SUBSTITUTED AMINOALKYL-S, S-DIPHENYL-SULFOXIMINES AND PROCESS FOR THEIR PRODUCTION

Gerhard Satzinger, Gundelfingen, Freiburg, and Peter Stoss, Wildtal, Germany, assignors to Warner-Lambert Company

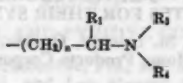
No Drawing. Filed Dec. 15, 1967, Ser. No. 697,263
Claims priority, application Germany, Dec. 22, 1966, G 48,828
Int. Cl. C07d *41/04*
U.S. Cl. 260—239 **20 Claims**

The present invention discloses a new class of N-substituted aminoalkyl - S,S - diphenyl-sulfoximines which in their free base form have the following structural formula:



I

wherein R represents a branched, heterocyclic, bicyclic or a polyacidic amino radical, or R represents a radical of the formula:



in which R_1 may be hydrogen or lower alkyl, and R_3 and R_4 may be alkyl or substituted alkyl, or R_3 and R_4 taken together with the nitrogen atom to which they are attached form a 5- or 6-membered heterocyclic ring system.

These compounds are prepared by treating a suspension of a diphenyl-sulfoximine-alkali metal compound in an anhydrous aromatic hydrocarbon solvent with a compound of the formula

Hal–R

wherein "Hal" is halogen and R is as defined.

These compounds exhibit broncholytic-antispasmodic activity in a mammalian host and are useful in treating conditions generally associated with bronchial diseases.

3,637,665

PROCESS FOR THE PREPARATION OF HIGH DENSITY N,N' - DIBENZYL-ETHYLENEDIAMINE BIS[D(—) - α - AMINOBENZYLPENICILLIN]

Arthur C. Adams, deceased, late of West Chester, Pa., by Mary Adams, administratrix, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Feb. 9, 1970, Ser. No. 10,050
Int. Cl. C07d *99/20*
U.S. Cl. 260—239.1 **4 Claims**

This invention concerns a process for the preparation of N,N' - dibenzylethylenediamine bis[D(—) - α - aminobenzylpenicillin] of high purity and density which is useful in the preparation of pharmaceutically elegant antibiotic dosage forms.

3,637,666

2-ANDROSTENE-17-ETHERS AND PROCESS FOR THE PREPARATION THEREOF

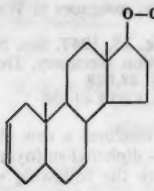
Klaus Irmscher, Gerhard Cimbollek, Helmut Wahlig, Karl-Otto Freisberg, Herbert Nowak, and Andreas Garbe, all of 250 Frankfurter Str., 6100 Darmstadt, Germany

No Drawing. Filed Apr. 8, 1970, Ser. No. 26,784

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.5 21 Claims

2-androstene-17-ethers of the formula



wherein n is 2, 3 or 4 and R_1 and R_2 each are alkyl of 1 to 3 carbon atoms or, collectively with the amino nitrogen atom, pyrrolidino, piperidino, hexamethylenimino, piperazino or morpholino, have cholesterol blood-level lowering activity, anti-fungal and anti-bacterial activity and steroidal hormonal activity.

3,637,667

8,19-EPOXY-$\Delta^{4,6}$-3-KETOSTEROIDS AND INTERMEDIATES FOR THEIR SYNTHESIS

Gunther Kruger, St. Laurent, Quebec, Canada, assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Feb. 10, 1970, Ser. No. 10,307

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 10 Claims

Disclosed herein are the 8,19-epoxysteroids, 8,19-epoxyandrosta - 4,6 - diene - 3,17 - dione, 8,19 - epoxy - 17β-hydroxyandrosta - 4,6 - dien - 3 - one and the 17 - lower acyl esters of the latter compound. The compounds are useful for lowering cholesterol concentrations in the blood serum and inhibiting gonadotrophin secretion. Methods for the preparation and use of these 8,19-epoxysteroids are given.

3,637,668

N-SUBSTITUTED 4-AMINOSTEROIDS

Henry Laurent, Hermann Steinbeck, and Rudolf Weichert, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

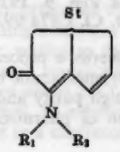
No Drawing. Filed Feb. 27, 1969, Ser. No. 803,058

Claims priority, application Germany, Feb. 29, 1968, P 16 68 689.8, P 16 68 690.1

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.5 32 Claims

4-aminosteroids of the partial formula



(I)

wherein R_1 and R_2 are alkyl or substituted alkyl and wherein R_1 and R_2, together with the nitrogen which is attached in the 4-position, may form an additional ring and wherein said additional ring may include a further hetero atom or a positive nitrogen and wherein St is a steroid molecule residue. The compounds have particular use as progestational agents. The compounds of the androstane series have androgenous, anabolic and anti-estrogenic properties.

3,637,669

NITRO DYESTUFFS

Ruedi Altermatt, Tecknau-Basel, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz A.G.), Basel, Switzerland

No Drawing. Filed Oct. 28, 1968, Ser. No. 771,372

Claims priority, application Switzerland, Nov. 17, 1967, 16,140/67

Int. Cl. C07d *15/04*

U.S. Cl. 260—239.6 10 Claims

This invention relates to disperse dyes of the nitro series which are substituted by a radical of formula

—O—CH_2—O—CH_2—

and are very suitable for dyeing and printing of fibres and fibre materials made of fully synthetic or semi-synthetic, hydrophobic, high molecular organic substances.

3,637,670

INTERMEDIATES AND PROCESS FOR PREPARING USEFUL 17α-HYDROXY-20-KETO AND 17α,21-DIHYDROXY-20-KETO PREGNANES AND DERIVATIVES THEREOF

John H. Fried, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,746

Int. Cl. C07c *169/32*

U.S. Cl. 260—239.55 R 15 Claims

New processes for preparing 17α-hydroxy-20-keto and 17α,21-hydroxy-20-keto pregnanes and derivatives thereof, which compounds are useful as progestational and anti-inflammatory agents. The processes utilize the steps of converting a 17-keto steroid to the corresponding 17-methylene steroid with methylene triphenylphosphorane, converting the 17-methylene steroid to the corresponding 17-spiro-(gem-dihalocyclopropyl) steroid with a dihalocarbene, converting the 17-spiro-(gem-dihalocyclopropyl) steroid to the corresponding 17-vinylidene steroid with a lower alkyl or phenyl lithium, and oxidizing the 17-vinylidene steroid to form the corresponding product pregnanes. The 17-spiro-(gem-dihalocyclopropyl) steroid intermediates are new compounds useful, via the disclosed process, for preparing the progestational and anti-inflammatory pregnane products.

3,637,671

17β-TETRAHYDROPYRANYL ETHERS OF THE 19-NOR-Δ^4 AND $\Delta^{5(10)}$-ANDROSTENES

Alexander D. Cross, Mexico City, Mexico, assignor to Syntex Corporation, Panama, Panama

No Drawing. Filed Mar. 30, 1966, Ser. No. 538,537

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 10 Claims

Novel 17β-tetrahydropyranyl ethers of the 19-nor-Δ^4-androstene series and $\Delta^{5(10)}$-androstene series substituted

at C–17 with a lower alkenyl or lower alkynyl group useful in fertility control.

3,637,672

AZOLE COMPOUNDS

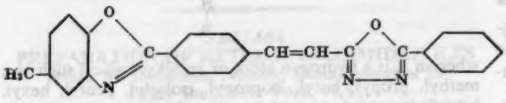
Shuichi Seino, Osaka, Tomizo Fujino, Suita-sha, and Kakuji Tonegawa, Kyoto, Japan, assignors to Osaka Seika Kogyo Kabushiki Kaisha, Osaka, and Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed July 9, 1968, Ser. No. 743,303

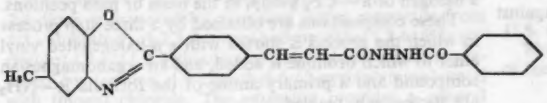
Int. Cl. C09b *23/14*

U.S. Cl. 260—240.9 9 Claims

Azole compounds useful for fluorescent brightening agents for synthetic fibers, such as



The compound is prepared by heating



with a dehydrating agent of thionyl chloride in order to cause ring formation.

3,637,673

OPTICAL BLEACHING OF ORGANIC MATERIAL

Ichiro Okubo and Michihiro Tsujimoto, Tokyo, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

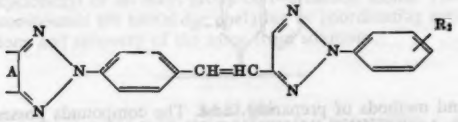
No Drawing. Filed Oct. 21, 1968, Ser. No. 769,429

Claims priority, application Japan, Oct. 26, 1967, 42/68,938

Int. Cl. C07d *55/04*

U.S. Cl. 260—240.9 1 Claim

An optical bleaching agent for organic materials comprising as an effective ingredient a bistriazolyl styrene derivative expressed by the general formula



wherein A represents a benzene, naphthalene or acenaphthene nucleus, with the proviso that when A is a benzene or naphthalene nucleus, it may have an alkyl group, alkoxy group, acylamino group, sulphonic acid group, sulphonate group, or sulphonamide group as a substituent; R_1 represents a cyano group, sulphonic acid group, substituted or unsubstituted sulphonamide group, aryl sulphonate group, alkylsulphone group, carbamoyl group, or carboxylate group; and R_2 represents a hydrogen atom, halogen atom or methyl group.

3,637,674

EPOXIDES OF ESTERS OF 2,4,6,10-TETRAENOIC ACIDS

Vaclav Jarolim, Karel Hejno, Karel Slama, and Frantisek Sorm, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

No Drawing. Filed Oct. 8, 1969, Ser. No. 864,912

Claims priority, application Czechoslovakia, Oct. 20, 1968, 7,127/68

Int. Cl. C07d *1/22*

U.S. Cl. 260—240 R 6 Claims

Methods employing and compositions comprising novel epoxides of esters of 2,4,6-10-tetraenoic acids for the control of insects.

3,637,675

PIPERIDYL AND PYRIDYL COMPOUNDS

Bernard Brust, Jacksonville, Fla., and Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application June 21, 1965, Ser. No. 465,774, now Patent No. 3,420,836, which is a continuation-in-part of application Ser. No. 380,949, July 7, 1964. Divided and this application Sept. 26, 1968, Ser. No. 763,021

Int. Cl. C07d *29/26*

U.S. Cl. 260—240 F 12 Claims

Piperidyl compounds and derivatives which are useful as anticonvulsants and also as intermediates in the preparation of related piperidyl compounds of pharmacologically important activity.

3,637,676

POLYMETHINE DYES CONTAINING A DILACTONE RING, INTERMEDIATES USEFUL IN THEIR SYNTHESIS AND PROCESS FOR PREPARING SAID INTERMEDIATES

Donald W. Heseltine, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application June 10, 1965, Ser. No. 463,024, now Patent No. 3,440,052. Divided and this application July 30, 1968, Ser. No. 763,456

Int. Cl. C09b *23/00*

U.S. Cl. 260—240.1 5 Claims

Novel polymethine dyes having at least two heterocyclic nuclei and wherein said polymethine dyes contain at

least one dilactone ring, useful as optical sensitizers for photographic silver halide emulsions or as filter dyes, are described. Novel intermediates useful in preparing said polymethine dyes and a novel process for preparing said intermediates are also described.

3,637,677

NITROSOAMINES

Carl T. Bahner, David H. Brotherton, and Mary K. Brotherton, Jefferson City, Tenn., assignors to the United States of America as represented by the Secretary of the Department of Health, Education, and Welfare

No Drawing. Filed Feb. 14, 1969, Ser. No. 799,505

Int. Cl. C07c *87/28*; C07d *33/52*

U.S. Cl. 260—240.9 **6 Claims**

A series of nitrosoamines which comprise 4-N-nitroso-N-alkylaminobenzylidene derivatives of a fused bicyclic moiety selected from 1-indene, 2-methyl quinoline, 4-methyl quinoline, and 1-methyl isoquinoline.

In contrast to the carcinogenic activity exemplified by related nitroso and amino compounds, members of the present group of nitroso compounds have exhibited carcinostatic activity in animals in standard tests against Walker 256 tumor.

3,637,678

DELTA-2 CEPHALOSPORIN COMPOUNDS

J. Alan Webber and Earle M. van Heyningen, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of abandoned application Ser. No. 703,523, Feb. 7, 1968. This application Jan. 13, 1969, Ser. No. 790,886

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **20 Claims**

3-bromomethyl - Δ^2 - cephalosporin ester intermediates, and Δ^2-3-functionalized cephalosporin esters prepared by (a) brominating the 3-methyl group of a Δ^2-desacetoxycephalosporin ester, and then (b) reacting the resulting 3-bromomethyl-Δ^2-cephalosporin ester with a nucleophilic reagent to displace the bromine with the nucleophile and to form 3-(functionalized-methyl)-Δ^2-cephalosporin esters which are useful as intermediates in the production of cephalosporin antibiotics, e.g., from penicillin starting materials.

3,637,679

QUATERNARY PHENOTHIAZINE SULFAMATE

Calvin Lovell, Morton Grove, and Henry William Sause, Deerfield, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Oct. 30, 1968, Ser. No. 772,024

Int. Cl. C07d *93/14*

U.S. Cl. 260—243 **5 Claims**

Phenothiazinylalkylammonium salts of sulfamic acids are described herein. They are useful as anti-ulcer agents, pepsin inhibitors, anti-bacterial agents, and anti-algal agents. The compounds are obtained by the reaction of the appropriate quaternary ammonium halide with silver oxide and an appropriate sulfamic acid.

3,637,680

2-(3-TRIFLUOROMETHYL)-PHENYL MORPHOLINES

Roland Yves Mauvernay, Norbert Busch, Jacques Moleyre, and Jacques Simond, Puy-de-Dome, France, assignors to Societe Anonyme: Centre Europeen de Recherches Mauvernay, Riom, Puy-de-Dome, France

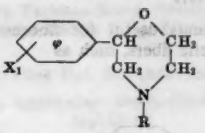
No Drawing. Filed Feb. 28, 1969, Ser. No. 803,400

Claims priority, application France, Mar. 4, 1968, 142,279; May 29, 1968, 153,287; June 18, 1968, 155,482; Aug. 27, 1968, 164,260; Nov. 15, 1968, 173,894; Feb. 19, 1969, 6904203

Int. Cl. C07d *87/30*

U.S. Cl. 260—247 **6 Claims**

New 2,4-disubstituted tetrahydro 1,4-oxazines of formula:



wherein R is a hydrogen atom or an alkyl radical such as a methyl, propyl, butyl, isopropyl, isobutyl, pentyl, hexyl, heptyl, isopentyl, or cyclohexyl, radical, an alkenyl radical such as an allyl radical, an aryl radical or an arylalkyl radical such as benzyl or phenylethyl radical, and X_1 is a halogen or a $-CF_3$ group, in the meta or para positions.

These compositions are obtained by a three step process in which the process is started with a β-halogenated vinyl ether to which bromine is added, and an organomagnesian compound and a primary amine of the formula $R-NH_2$ are successively reacted.

These compounds are useful as medicaments or as intermediaries in the synthesis of pharmaceutical products. Essentially, they have a tranquilizing effect on the central nervous system and also possess an anti-inflammatory and analgesic activity.

3,637,681

1-TERTIARYAMINO ALKANOYL - 2-HYDROGEN, METHYL OR PHENYL-3-METHYL OR PHENYL-4-OXO-1,2,3,4-TETRAHYDROQUINAZOLINES

Giuseppe Bonola, Milanese, Paolo Da Re, Pisa, and Ivo Setnikar, Milan, Italy, assignors to Societe d'Exploitations Chimiques et Pharmaceutiques Seceph, Lugano, Switzerland

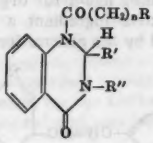
No Drawing. Filed June 12, 1968, Ser. No. 736,289

Claims priority, application Switzerland, June 20, 1967, 8,716/67

Int. Cl. C07d *87/42*

U.S. Cl. 260—247.2 **21 Claims**

1,2,3,4-tetrahydroquinazoline derivatives of the general formula:



and methods of preparing same. The compounds possess choleretic and antifibrillatory activity.

3,637,682

N-2-HYDROXY ALKYL MORPHOLINE OXIDES

John Fred Gerecht, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Oct. 24, 1967, Ser. No. 677,723

Int. Cl. C07d *87/32*

U.S. Cl. 260—247.7 A **2 Claims**

Hydroxy higher alkyl morpholine oxides, and formulations containing the same. The compounds have many

beneficial effects in detergent and cosmetic compositions, particularly desirable for application to the skin and for modification of foaming power of detergent compositions.

3,637,683

PROCESS FOR THE PREPARATION OF 4-(2-HYDROXYPROPIONOYL) MORPHOLINE

Daijiro Nishio, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

Filed Nov. 4, 1968, Ser. No. 772,958
Claims priority, application Japan, Nov. 2, 1967, 42/70,563
Int. Cl. C07d *87/34*
U.S. Cl. 260—247.7 A 1 Claim

An improved process for preparing 4-(2-hydroxypropionoyl) morpholine by the ring-opening reaction of beta-propiolactone with morpholine, the improvement which comprises conducting the ring-opening reaction in the presence of dehydrated diethyl ether.

3,637,684

PREPARATION OF HETEROCYCLOIMIDAZOLES

Irving M. Goldman, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Jan. 5, 1968, Ser. No. 695,861
Int. Cl. C07d *51/46*
U.S. Cl. 260—248 AS 2 Claims

1,3-dimethyl - 1,2,3,4 - tetrahydropyrido[2,1-f]purine-2,4-dione is prepared by extruding sulfur monoxide from 1,3 - dimethyl - 1,2,3,4 - tetrahydropyrido[1,2-b]6H- pyrimido[4,5-e][1,2,4]thiadiazine-2,4,5-trione, which is prepared by treating 1,3-dimethyl-6-(2-pyridylamino)uracil with thionyl chloride. The extrusion provides a general route to various imidazoles, especially heterocycloimidazoles, through intermediate 2H-1,2,4-thiadiazine-1-oxides which can be prepared from N-vinylamidines. An alternative route is heating 1,3-dimethyl-5-halo-6-(2-pyridylamino)uracil. Novel 1,3-dimethyl-1,2,3,4-tetrahydroheterocyclo[x,y-f]purine-2,4-diones are useful for a variety of biological and chemotherapeutic purposes.

3,637,685

TRIAMINO-s-TRIAZINES

Gaetano F. D'Alelio, South Bend, Ind., assignor of a fractional part interest to Walter J. Monacelli, Cleveland, Ohio

No Drawing. Filed May 15, 1967, Ser. No. 638,654
Int. Cl. C07d *55/24*
U.S. Cl. 260—249.6 5 Claims

The compositions disclosed herein comprise derivatives of symmetrical triazines in which at least one of the derivative groups has a radical of the formula

—CHR⁴COOM

wherein M is hydrogen, a quaternary ammonium group or metal, and R^4 represents hydrogen, phenyl, cycloheptyl, cyclohexyl or an alkyl group of 1–6 carbon atoms. These compounds are useful for chelating or coordinating metal ions and recovery of the same from solutions.

3,637,686

PROCESS FOR RECOVERING PURIFIED MELAMINE

Ryo Kokubo, Koji Yokomichi, Yasuo Takakuwa, Isao Maruyama, and Akihiro Shiroishi, Fuchumachi, and Mizuhiko Nagakura, Tokyo, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Feb. 10, 1969, Ser. No. 798,022
Int. Cl. C07d *55/24*
U.S. Cl. 260—249.7 P 4 Claims

A process for recovering purified melamine comprising cooling the crude molten melamine obtained through thermal decomposition of urea or a mixture of said crude molten melamine, ammonia and carbon dioxide, etc. rapidly in two steps to dissolve the melamine, and then crystallizing the high-purity melamine in two steps.

3,637,687

POLYSUBSTITUTED AS-TRIAZINO[5,6-b]INDOLES

Alfred W. Chow, Radnor, Pa., assignor to Smith Kline & French Laboratories

No Drawing. Filed Apr. 21, 1970, Ser. No. 30,576
Int. Cl. C07d *57/34*
U.S. Cl. 260—249.9 10 Claims

The compounds are as-triazino[5,6-b]indoles polysubstituted on the benzene ring substituted on the triazine ring at the 3-position with a hydroxyalkylamino group which have antiviral activity.

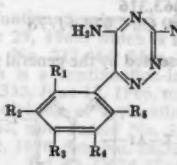
3,637,688

6-(FLUORO AND TRIFLUOROMETHYL PHENYL)-3,5-DIAMINO - 1,2,4 - TRIAZINES AND SUBSTITUTED - 6 - PHENYLALKYL-3,5-DIAMINO-1,2,4-TRIAZINES

Richard W. Rees, Newtown Square, and Peter B. Russell, Villanova, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Jan. 9, 1970, Ser. No. 1,842
Int. Cl. C07d *55/10*
U.S. Cl. 260—249.9 7 Claims

This invention includes but is not limited to compounds of the formula:



wherein

R_1 is selected from the group consisting of hydrogen and fluorine;

R_2, R_3 and R_4 are selected from the group consisting of hydrogen, fluorine and trifluoromethyl;

R_5 is hydrogen, with the proviso that at least one member selected from the group consisting of R_1, R_2, R_3 and R_4 are always fluorine or trifluoromethyl. The compounds are useful in the treatment of malaria.

3,637,689

PROCESS FOR THE PREPARATION OF 4,6-DIAMINO-2-VINYL-s-TRIAZINE

Goro Inoue, Tokyo, and Hirokazu Fukumi, Iruma-gun, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Kita-ku, Osaka, Japan

No Drawing. Filed May 27, 1970, Ser. No. 41,049
Claims priority, application Japan, May 31, 1969, 44/42,092
Int. Cl. C07d *55/20*
U.S. Cl. 260—249.9 8 Claims

An economically attractive process for the industrial production of 4,6-diamino-2-vinyl-s-triazine in high yield is provided. 1,2-bis(4′,6′-diamino-s-triazinyl-(2′))-cyclobutane, available as a low cost-industrial commodity, is heated under reduced pressure to prevent thermal decomposition of the triazine rings and to crack the carbon-carbon bonds between the 1- and 2-positions and between the 3- and 4-positions of the cyclobutane ring. The resulting product is a useful monomer in the production of homo- or copolymers.

3,637,690
TETRAZOLO PYRIDAZINES
Paul L. Anderson, Denville, and William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed Apr. 4, 1969, Ser. No. 813,695
Int. Cl. C07d 51/04
U.S. Cl. 266—250 3 Claims

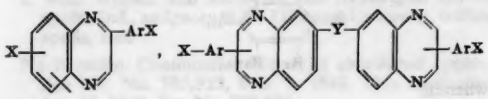
Alkenylamino tetrazolo pyridazines, e.g., 6-chloro-8-β - methallylamino tetrazolo[1,5-b]pyridazine, are useful as hypotensives.

3,637,691
CHLOROPYRIDAZINECARBONITRILE COMPOUNDS
Donald E. Bublitz, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed June 6, 1969, Ser. No. 831,216
Int. Cl. C07d 51/04
U.S. Cl. 260—250 7 Claims

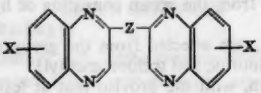
Disclosed as novel compounds are chloropyridazinecarbonitrile compounds substituted by at least one chloro radical and at least one cyano group, the total number of chloro and cyano groups present being 3 or 4. The compounds have utility as fungicides, herbicides and antimicrobials, among other applications.

3,637,692
SUBSTITUTED QUINOXALINES
Billy M. Culbertson, 150 Maple Island Road, Burnsville, Minn. 55378
No Drawing. Continuation of application Ser. No. 539,641, Apr. 4, 1966. This application Oct. 2, 1969, Ser. No. 863,316
Int. Cl. C07d 51/78
U.S. Cl. 260—250 8 Claims

Quinoxalines represented by the general formulae



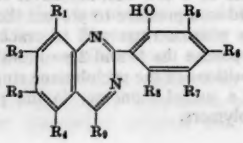
and



wherein X is nitro or amino, Ar is a divalent aromatic hydrocarbon radical, Y is a covalent bond or a divalent linking radical and Z is a divalent radical containing one or two benzene rings. The compositions are useful in the formation of fiber and film forming polyimides and polyamides and in the formation of molding resins.

3,637,693
HYDROXYARYLQUINAZOLINES AND THEIR USE AS UV-ABSORBERS
Jan-Erik Anders Otterstedt, Pennsville, N.J., and Richard Pater, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed July 12, 1968, Ser. No. 744,310
Int. Cl. C07d 51/48
U.S. Cl. 260—251 13 Claims

Novel ultra-violet absorbing 2-(o-hydroxyaryl)quinazolines of the formula



wherein R_{1-4} are selected from H and other substituents having Hammett para sigma values of −0.67 to +0.78; R_{5-8} are selected from H and other substituents having Hammett para sigma values of −0.67 to +0.25; and R_9 is selected from H and substituents, other than hydroxyl, having a Hammett para sigma value of −0.67 to +0.25; said substituents, when other than a single hydrogen or halogen atom, being joined to the quinazoline ring through a carbon, nitrogen or oxygen atom; and the use of such compounds as light screens and photostabilizers in photodegradation-prone substrates.

3,637,694
4,5,6-TRICHLORO-2-CHLOROCARBONYL-PYRIMIDINE
Gunther Beck and Hans Holtschmidt, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Mar. 14, 1969, Ser. No. 807,437
Claims priority, application Germany, Mar. 25, 1968, P 17 70 049.1
Int. Cl. C07d 51/36
U.S. Cl. 260—251 6 Claims

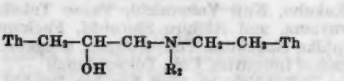
A process for the production of 4,5,6-trichloro-2-chlorocarbonyl-pyrimidine by reacting 4-morpholino-propionitrile with chlorine, optionally in the presence of ultraviolet radiation, followed by heating in the absence of chlorine, is disclosed. The compound finds utility in the production of reactive dyestuffs.

3,637,695
SYNTHESIS OF HOMOPTEROIC AND HOMOFOLIC ACID
Young-Ho Kim, Vytautas Grubliauskas, and Orrie M. Friedman, Waltham, Mass., assignors to the United States of America as represented by the Secretary of Health, Education, and Welfare
No Drawing. Filed Mar. 20, 1968, Ser. No. 714,426
Int. Cl. C07d 57/28
U.S. Cl. 260—251.5 2 Claims

The production of homopteroic and homofolic acids by virtue of selecting a critical keto condensing agent, namely 1 - acetoxy-4-[N-acetyl - (p - carbethoxyphenyl) amino]-2-butanone, which is condensed with a conventional pyrimidine reactant, namely 6-hydroxy-2,4,5-triaminopyrimidine, under condition of narrow pH control, preferably in the mildly alkaline range 9.0–9.4.

3,637,696
THEOPHYLLINE AND THEOBROMINE SUBSTITUTED AMINES
Walter Otto, Vienna, Austria, assignor to Gerot Pharmazeutika Dr. Walter Otto K.G., Vienna, Austria
No Drawing. Filed Aug. 21, 1967, Ser. No. 661,824
Claims priority, application Austria, Aug. 23, 1966, A 7,999/66
Int. Cl. C07d 57/42, 57/48
U.S. Cl. 260—256 9 Claims

A substituted amine having the formula



wherein each Th is 7-theophylline or 1-theobromine and R_2 is selected from alkyl and hydroxyalkyl groups, wherein each of said alkyl and hydroxyalkyl groups is a straight or branched chain alkyl containing 1–4 carbon atoms.

3,637,697
6-AMINO-1,2-DIHYDRO-1-HYDROXY-2-IMINOPYRIMIDINES

William C. Anthony, Kalamazoo, and Joseph J. Ursprung, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original application Nov. 1, 1965, Ser. No. 505,993, now Patent No. 3,461,461, dated Aug. 12, 1969. Divided and this application Feb. 20, 1969, Ser. No. 801,177

Int. Cl. C07d *151/34*

U.S. Cl. 260—256.4 H **6 Claims**

6-amino-1,2-dihydro-1-hydroxy - 2 - iminopyrimidines, their carboxyacylated counterparts, and the corresponding acid addition salts thereof are disclosed. These compounds, useful inter alia as antihypertensive agents, are substituted in the 4-position and in the 5-position, the substituent in the 4-position being a secondary or tertiary amino moiety.

3,637,698
HALO-SULFAMYLSPIRO- AND DIALKYL-QUINAZOLINONES

Bola Vithal Shetty, Rochester, N.Y., assignor to Pennwalt Corporation

No Drawing. Filed Mar. 11, 1968, Ser. No. 711,855

Int. Cl. C07d *51/48*

U.S. Cl. 260—256.5 R **11 Claims**

A 7'halo-6'-sulfamylspiro- or dialkyl-4,2'(1'H)-quinazolin-4'(3'H)-one, having the spiro group in the 2-position, hydrogen or alkyl in the 3-position, and hydrogen, alkyl, amino, halogen or haloloweralkyl in the 5- and 8-positions. The hydrogens of the sulfamyl group may be substituted by alkyl or phenylalkyl or together form a carbocyclic or heterocyclic ring. The spiro group can be composed entirely of carbon atoms or can contain one or more hetero atoms, especially sulfur, nitrogen or oxygen. The compounds are useful in diuretics and saluretics.

3,637,699
DIALKYL-SUBSTITUTED-4-(HYDROXYALKYL-BEARING)AMINOQUINAZOLINES NITRATES

Lloyd P. Gabel, Morris Plains, and William R. J. Simpson, Hanover, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 841,990, July 15, 1969. This application Feb. 24, 1970, Ser. No. 13,818

Int. Cl. C07d *51/48*

U.S. Cl. 260—256.4 Q **15 Claims**

Disclosed are compounds of the class of quinazolines substituted in the benzene ring portion of the quinazoline by lower alkyl and further substituted at the 4-position by an amino function bearing a hydroxyalkyl nitrate moiety, e.g., 4-(5-hydroxypentyl)amino-7,8 - dimethylquinazoline nitrate. The compounds have pharmacological activity in animals and are useful, for example, as hypotensive and coronary dilating agents. Also disclosed are the corresponding hydroxy intermediates useful in preparation of the nitrates.

3,637,700
CERTAIN TRIALKOXY-SUBSTITUTED 4-AMINOQUINAZOLINE NITRATES

Lloyd P. Gabel, Morris Plains, and William R. J. Simpson, Hanover, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 870,439, Dec. 5, 1969. This application Nov. 13, 1970, Ser. No. 89,472

Int. Cl. C07d *31/48*

U.S. Cl. 260—256.5 R **26 Claims**

Disclosed are compounds of the class of quinazolines substituted in the benzene ring portion of the quinazoline by trialkoxy and further substituted at the 4-position by an amino function bearing a hydroxyalkyl nitrate moiety, e.g., 4-(5-hydroxypentyl) amino-6,7,8-trimethoxyquinazoline nitrate. The compounds have pharmacological activity in animals and are useful, for example, as hypotensive, coronary dilators and antianginal agents. Also disclosed are the corresponding hydroxy intermediates useful in preparation of the nitrates.

3,637,701
CERTAIN NITRATE DERIVATIVES OF 4-AMINOQUINAZOLINES

Lloyd P. Gabel and William R. J. Simpson, Morris Plains, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 803,933, Mar. 3, 1969. This application June 26, 1969, Ser. No. 838,050

Int. Cl. C07d *51/48*

U.S. Cl. 260—256.4 Q **22 Claims**

The invention disclosed compounds of the class which are nitrates of 4-substituted-amino-quinazolines, e.g., 4-(2-hydroxyethyl)amino-6,7-dimethoxyquinazoline nitrate, having pharmacological activity in animals and useful, for example, as hypotensive and anti-anginal agents. Also disclosed are the hydroxy intermediates useful in preparation of said nitrates.

3,637,702
1-[HYDROXYALKYL]-2-MORPHOLINOMETHYL-5-NITROIMIDAZOLES

Dale R. Hoff, Basking Ridge, N.J., and David W. Henry, Menlo Park, Calif., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 848,404, July 29, 1969, which is a continuation of application Ser. No. 717,464, Mar. 29, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 565,333, June 17, 1966, now abandoned, which in turn is a division of application Ser. No. 355,428, Mar. 27, 1964, now Patent No. 3,299,090. This application Nov. 2, 1970, Ser. No. 86,331

Int. Cl. C07d *87/40*

U.S. Cl. 260—247.5 R **1 Claim**

1-(2'-hydroxyethyl) - 2 - morpholinomethyl - 5 - nitroimidazole is a novel compound prepared from 1-(2'-hydroxyethyl) - 2 - hydroxymethyl - 5 - nitroimidazole, having utility against parasitic diseases, especially histomoniasis and trichomoniasis.

3,637,703
URACIL THIOPSEUDOUREAS

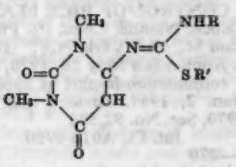
Arthur Berger, Skokie, Ill., and Edeltraut E. Borgaes, Sindelfingen, Germany, assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Filed Aug. 13, 1969, Ser. No. 849,891

Int. Cl. C07d *51/30*

U.S. Cl. 260—256.5 **7 Claims**

Uracil thiopseudoureas having the general formula:



wherein R and R' are each independently selected from the group consisting of lower alkyl having from 1 to 3 carbon atoms, allyl and methallyl, and the pharmaceutically acceptable acid salts thereof, for example, 1-allyl-3-(2',4'-diketo - 1',2',3',4'-tetrahydropyrimidin-6-yl)-1',2,3'-trimethyl-2-thiopseudonrea. These compounds are useful central nervous system anti-depressants.

3,637,704
1γ-(p-FLUOROBENZOYL)PROPYL-4-PHENYLALKYL PIPERAZINE
Susumu Umemoto, Sakai-shi, Yasutaka Nagai, Kyoto-fu, and Keiji Nakamura, Neyakawa-shi, Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Higashi-ku, Osaka, Japan
No Drawing. Filed Apr. 23, 1968, Ser. No. 723,581
Claims priority, application Japan, Oct. 18, 1967, 42/67,137, 42/67,138; Oct. 19, 1967, 42/67,364
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 R 14 Claims

Novel 1-aroylpropyl-4-aralkyl piperazines and pharmaceutically acceptable non-toxic salts thereof which are useful as the psychotropic agents, and to compositions for psychotropic agents which comprise as an active component a 1-aroylpropyl-4-aralkyl piperazine or a pharmaceutically acceptable non-toxic salt thereof.

3,637,705
N-3,4-DIHALO PHENYL PIPERAZINES
Bruce Wayne Horrom, Waukegan, and Howard Bernard Wright, Gurnee, Ill., assignors to Abbott Laboratories, Chicago, Ill.
No Drawing. Filed Oct. 1, 1968, Ser. No. 764,323
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 PH 2 Claims

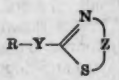
It has been found that certain specifically halogen substituted N-phenylpiperazines and N-phenyl-N'-tetrahydropyranylpiperazines have unusually strong anorexigenic properties. The specific substituents must be in the 3- and 4-positions of the phenyl ring to produce these outstanding pharmacological results.

3,637,706
10-[4 - (LOWER)ALKYLPIPERAZINO] - 1,2,3,4-TETRAHYDROBENZO[b][1,6]NAPHTHYRIDINE DERIVATIVES USEFUL AS CNS DEPRESSANTS
Milton Wolf, West Chester, and James L. Diebold, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Division of application Ser. No. 760,063, Sept. 16, 1968, which is a continuation-in-part of applications Ser. No. 533,802 and Ser. No. 533,793, Mar. 14, 1966, and Ser. No. 581,756, Sept. 22, 1966. This application Apr. 30, 1970, Ser. No. 33,509
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 TR 2 Claims

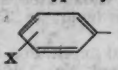
This invention concerns 10-[4-(lower)alkylpiperazino]-1,2,3,4 - tetrahydrobenzo[b][1,6]naphthyridines and the pharmacologically acceptable acid addition salts thereof which are pharmacologically active as central nervous system depressants which are useful in producing a calming effect in warm-blooded animals.

3,637,707
2-(SUBSTITUTED) 2-THIAZOLINES FOR THE CONTROL OF RICE BLAST
Richard C. Koch, Niantic, Conn. (% Pfizer, Inc., 235 E. 42nd St., New York, N.Y. 10017)
No Drawing. Application May 28, 1970, Ser. No. 41,532, which is a continuation-in-part of application Ser. No. 788,642, Jan. 2, 1969. Divided and this application Nov. 24, 1970, Ser. No. 92,504
Int. Cl. A01n *9/20*
U.S. Cl. 424—270 9 Claims

The control of rice blast disease on rice plants by contacting the plants with a fungicidally effective amount of a composition comprising, as active ingredient, a compound having the formula



and the non-phytotoxic acid addition salts thereof, and a carrier therefor, wherein R is 2-thienyl, 1-naphthyl, 2-naphthyl, 3,4-methylenedioxyphenyl or



wherein

X is hydrogen, chloro, bromo, fluoro, nitro, methyl, or ethyl, with the proviso that when Y is $-(CH_2)_n-$, X is other than hydrogen;

Y is —CH=CH—, $-C(CH_3)=CH-$, $-CH=C(CH_3)-$, —C(OH)=CH— or $-(CH_2)_n-$ wherein *n* is an integer of from 2 to 4; and

Z is ethylene or trimethylene.

3,637,708
WATER-INSOLUBLE PERINONE DYESTUFFS
Richard Peter and Enrico Gallacchi, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland
No Drawing. Filed Nov. 20, 1967, Ser. No. 684,522
Claims priority, application Switzerland, Nov. 21, 1966, 16,658/66; Oct. 16, 1967, 14,444/67
Int. Cl. C07d *57/02*
U.S. Cl. 260—282 6 Claims

Water-insoluble perinones carrying at one of the peri-positions of the naphthalene nucleus a heterocyclic substituent bound via a sulfur, nitrogen or oxygen atom.

3,637,709
TETRAHYDROISOQUINOLINE-2 CARBOXAMIDES
William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Application May 21, 1968, Ser. No. 730,957, now Patent No. 3,565,900, dated Feb. 23, 1971, which is a continuation-in-part of application Ser. No. 663,218, Aug. 25, 1967. Divided and this application May 27, 1970, Ser. No. 51,403
Int. Cl. C07d *35/10*
U.S. Cl. 260—287 R 6 Claims

1-(α hydroxy benzyl) 1,2,3,4 tetrahydro isoquinolines-2 carboxamides are cyclized with $SOCl_2$ to form oxazolo [4,3-a]isoquinolines.

3,637,710
4-(PHENYLIMINO)-1,4-DIHYDROQUINOLINE DERIVATIVES
Jan W. F. Wasley, Ossining, and Norbert Gruenfeld, Bronx, N.Y., assignors to Geigy Chemical Corporation, Greenburgh, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 694,411, Dec. 29, 1967. This application May 26, 1969, Ser. No. 827,998
Int. Cl. C07d *33/48*
U.S. Cl. 260—287 R 17 Claims

4-[(carboxyalkyl and carbalkoxyalkyl)phenylimino]-1,4-dihydroquinolines and derivatives thereof are anti-inflammatory and antimalarial agents which can be synthetically prepared by a number of routes. A typical embodiment is 7-chloro-4-[2-(carbomethoxymethyl)phenylimino]-1,4-dihydroquinoline.

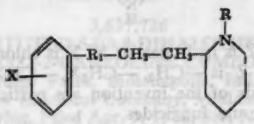
3,637,711
BETA-ALKENYL SUBSTITUTED 8-HYDROXYQUINOLINES
Walter M. Budde, Jr., Prior Lake, and James A. Hartlage, Burnsville, Minn., assignors to Ashland Oil & Refining Company, Houston, Tex.
Filed Mar. 25, 1968, Ser. No. 715,879
Int. Cl. C07d *33/38*
U.S. Cl. 260—289 4 Claims

Metal values, e.g., copper values, are recovered from aqueous solutions by solvent extraction with an organic

solvent containing hydrocarbyl-substituted 8-hydroxyquinoline derivatives, such as alkylbenzyl or β-alkenyl 8-hydroxyquinolines.

3,637,712
PIPERIDYLPROPANOL COMPOUNDS
Richard Anthony Partyka, Liverpool, and Robert Ted Standridge and Barbara Ann Hall, Syracuse, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
No Drawing. Filed Jan. 26, 1970, Ser. No. 5,922
Int. Cl. C07d 29/16
U.S. Cl. 260—294.7 R 3 Claims

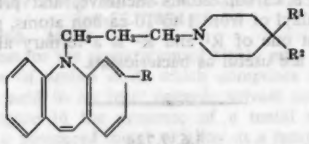
The specification discloses substituted piperidylpropanols and propanones of the structure



wherein X is halogen, hydrogen, or lower alkoxy, R_1 is hydroxymethylene or carbonyl, and R is lower alkyl and nontoxic acid addition salts thereof and a process for preparing the hydroxy compound by preparation and reduction of the carbonyl compounds. The hydroxy compounds are useful in the treatment of mammals and in the study of physiology and pharmacology.

3,637,713
DIBENZAZEPINE DERIVATIVES
Michio Nakanishi, Nakatsu, Oita, and Chiaki Tashiro, Fukuoka, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Higashiku, Osaka, Japan
No Drawing. Filed July 3, 1968, Ser. No. 742,135
Claims priority, application Japan, July 3, 1967, 42/42,657; Feb. 7, 1968, 43/7,571
Int. Cl. C07d 41/08, 99/10
U.S. Cl. 260—293.59 24 Claims

Compounds of the formula



wherein R is H or Cl, R^1 is OH, cyano, carbamoyl, methoxy or acetyl, R^2 is phenyl, tolyl, (trifluoromethyl) phenyl, benzyl, dimethylamino or piperidino, or R^1 and R^2 combinedly can represent —S—CH_2—CO—N(R^3)— in which R^3 is H, phenyl, tolyl or (trifluoromethyl)phenyl, and pharmaceutically acceptable acid addition salts thereof are useful e.g. as vasodilators.

3,637,714
5 - FLUORO-3-PYRIDINEMETHANOL ESTERS THEREOF AND THERAPEUTICALLY ACCEPTABLE SALTS THEREOF
Lars Anders Fritz Carlsson, Bromma, Åke John Erik Helgstrand, Enhorna, and Berndt Olof Harald Sjöberg and Nils Erik Stjernstrom, Sodertalje, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden
No Drawing. Filed Nov. 15, 1967, Ser. No. 689,751
Claims priority, application Sweden, Nov. 16, 1966, 15,717/66
Int. Cl. C07d 31/48, 31/34
U.S. Cl. 260—294.8 R 2 Claims

The invention relates to 3,5-substituted pyridines, which in one of the positions 3 and 5 may be substituted by halogen or —NH_2, and in the other position are substituted by an organic group. The compounds are useful for the inhibition of serum lipid mobilization.

3,637,715
AMMOXIDATION OF 2-PICOLINE TO PICOLINONITRILE
Francis M. Scheidt, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 3, 1968, Ser. No. 757,121
Int. Cl. C07d 31/46
U.S. Cl. 260—294.9 3 Claims

A novel and improved method for preparing 2-picolinonitrile by passing a non-flammable mixture of 2-picoline, ammonia and air at an ammoxidation temperature over a vanadium oxide catalyst.

3,637,716
POLYCHLORO DERIVATIVES OF MONOCARBOXY PYRIDINES
Russell M. Bimber, Painesville, and Paul H. Schuldt, Mentor, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio
No Drawing. Filed July 9, 1969, Ser. No. 840,484
Int. Cl. C07d 31/36
U.S. Cl. 260—295 R 5 Claims

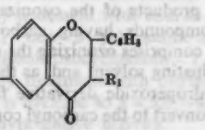
Novel polychloroderivatives of monocarboxy and dicarboxy pyridines and their amino derivatives, their methods of preparation and utilization as pesticides and intermediates are disclosed.

3,637,717
NICOTINIC ACID ESTER
Eupremio Vitale, Bologna, Italy, assignor to Alfa Farmaceutici S.p.A., Bologna, Italy
No Drawing. Filed Apr. 17, 1969, Ser. No. 817,190
Claims priority, application Spain, Apr. 19, 1968, 352,933
Int. Cl. C07d 31/36
U.S. Cl. 260—295.5 R 1 Claim

The invention is concerned with a new chemical compound, guaiacol salicylate nicotinate, which possesses analgesic activity; pharmaceutical compositions (particularly orally administrative compositions) containing the new compound and the preparation of the new compound by the reaction of guaiacol salicylate with nicotinyl chloride hydrochloride in the presence of an acid binding agent.

3,637,718
3-LOWER-ALKYL-6-HYDROXYFLAVANONES AND ESTERS THEREOF
Josef Krämer, Herbert Halpaap, and Karl-Otto Freisberg, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany
No Drawing. Filed June 21, 1968, Ser. No. 738,832
Int. Cl. C07d 7/24, 31/36
U.S. Cl. 260—295.5 B 23 Claims

Suitable for decreasing cholesterol levels, compounds of the following formula, esters and ester salts thereof:



wherein

R_1 represents alkyl of 1–6 carbon atoms,

R_2 represents hydrogen, alkyl or 1–6 carbon atoms or Z-$(CH_2)_n$—,

Z is dialkylamino of 2–6 carbon atoms, pyrrolidino, piperidino or morpholino, and

n is 2 or 3.

3,637,719

5-[2-(PHENYLAMINO)-3-PYRIDYL]TETRAZOLES SUBSTITUTED IN THE PHENYL NUCLEUS

Charles Hoffmann, Enghien-les Bains, and Andree Dordilly, born Faure, Paris, France, assignors to Societe Anonyme dite: Hexachimie, Gennevilliers, France

No Drawing. Filed July 10, 1969, Ser. No. 840,840
Claims priority, application Great Britain, July 10, 1968, 32,986/68
Int. Cl. C07d *31/42*
U.S. Cl. 260—296 R 2 Claims

Novel 5 - [2 - (phenylamino) - 3 - pyridyl]tetrazoles substituted in the phenyl nucleus, e.g. by trifluoromethyl, are useful as anti-inflammation agents, analgesics, and local anaesthetics.

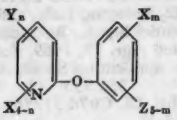
3,637,720

CERTAIN SUBSTITUTED PYRIDYL PHENYL ETHERS

Ryuzo Nishiyama, Kyoto, and Kanichi Fujikawa, Isao Yokomichi, and Fumio Kimura, Kusatsu-shi, Japan, assignors to Ishihara Sangyo Co., Ltd., Osaka, Japan

No Drawing. Filed June 17, 1968, Ser. No. 737,324
Claims priority, application Japan, June 15, 1967, 42/37,832
Int. Cl. C07d *31/30*
U.S. Cl. 260—297 R 10 Claims

A compound having the formula



wherein X represents a hydrogen atom, Y being a chlorine atom, or a methyl radical; *n* is an integer of 1 to 4; Z represents a chlorine atom, a methyl radical, or a nitro radical; and *m* is an integer of 1 to 5, and a herbicidally effective salt or N-oxide thereof.

3,637,721

PROCESS FOR PRODUCING ALDEHYDES BY OZONIZING AND REDUCING CERTAIN AROMATIC AND HETEROCYCLIC COMPOUNDS CONTAINING CARBON-TO-CARBON UNSATURATION

James J. Pappas, Parsippany, and William P. Keaveney, Pequannock, N.J., assignors to Inmont Corporation, Clifton, N.J.

No Drawing. Continuation-in-part of application Ser. No. 543,079, Apr. 18, 1966. This application June 25, 1970, Ser. No. 49,971
Int. Cl. C07d *31/32*; C07c *47/52, 47/54*
U.S. Cl. 260—297 R 9 Claims

An improved process for producing carbonyl compounds as products of the ozonization and reduction of organic compounds having carbon-to-carbon unsaturation which comprises ozonizing the unsaturated compound in a participating solvent and, as the improvement, reducing the hydroperoxide derivative formed thereby with a sulfide to convert to the carbonyl compound.

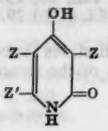
3,637,722

HALOGENATED-4-HYDROXY-6-METHYL-2(1H)PYRIDONES

Chun-shan Wang and Thomas W. McGee, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 17, 1969, Ser. No. 807,962
Int. Cl. C07d *31/30*
U.S. Cl. 260—297 Z 3 Claims

The invention relates to halogenated-4-hydroxy-6-methyl-2(1H)pyridones of the formula



wherein each Z is hydrogen or X; X is chlorine, bromine or iodine; and Z' is $—CH_3$, $—CH_2X$, $—CHX_2$ or $—CX_3$. The compounds of the invention are particularly useful as insecticides and fungicides.

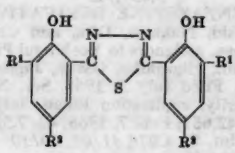
3,637,723

CERTAIN BIS(HYDROXYPHENYL)-1,3,4-THIADIAZOLES

William H. Meek, Northfield, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

No Drawing. Filed Aug. 21, 1969, Ser. No. 852,084
Int. Cl. C07d *91/62*
U.S. Cl. 260—302 D 2 Claims

Novel 2,5-disubstituted-1,3,4-thiadiazoles of the formula:



wherein R^1 and R^2 can be hydrogen, tertiary alkyl of from 4 to 8 carbon atoms inclusive, and primary or secondary alkyl of from 1 to 10 carbon atoms, providing that at least one of R^1 and R^2 is a tertiary alkyl. The compounds are useful as bacteriostats.

3,637,724

BENZOTHIADIAZOLE SALICYLAMIDES

Peter Kirby, Kent, England, assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Jan. 23, 1970, Ser. No. 5,425
Int. Cl. C07d *91/56*
U.S. Cl. 260—304 7 Claims

Certain novel N-(1,2,3-benzothiadiazolyl)-salicylamides, useful as cesticides.

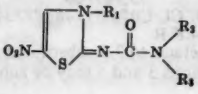
3,637,725

CERTAIN 5-NITRO-4-THIAZOLIN-2-YLIDENEUREA COMPOUNDS

Leslie M. Werbel, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 733,266, May 31, 1968. This application Mar. 10, 1969, Ser. No. 805,802
Int. Cl. C07d *91/22*
U.S. Cl. 260—306.7 6 Claims

5-nitro-4-thiazolin-2-ylideneurea compounds having the formula



where R_1 is alkyl, alkenyl, chloroalkenyl, dichloroalkenyl, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, benzyl, substituted benzyl, aralkyl, aryloxyalkyl, alkanoyloxyalkyl, cycloalkylalkyl, or propynyl; R_2 is hydrogen, alkyl, cycloalkyl, chloroethyl, allyl, or propynyl; R_3 is hydrogen, methyl, or ethyl; or R_2 and R_3 together with -N represent heterocyclic amino; and their production by (a) reacting a 4-thiazolin-2-ylideneurea or a salt thereof with a nitrating agent, (b) reacting a 5-nitro-2-thiazolylurea with an organic halide in the presence of a base, or (c) reacting one of the 3-hydroxyalkyl compounds with an alkanoic acid or a reactive derivative thereof to produce one of the 3-alkanoyloxy compounds. The compounds are useful schistosomacides and trichomonacides.

3,637,726
SUBSTITUTED-5-[(3,4-DIHALOPHENOXY) METHYL]-2-OXAZOLINE COMPOUNDS
Herman Eldridge Faith, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Apr. 9, 1970, Ser. No. 27,132
Int. Cl. C07d *85/28*
U.S. Cl. 260—307 F **6 Claims**

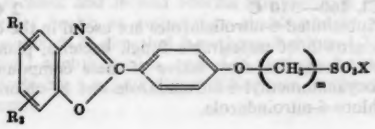
Substituted - 5 - [(3,4 - dihalophenoxy)methyl] - 2-oxazoline compounds and their pharmaceutically-acceptable salts, such as 2-amino-5-[(3,4-dichlorophenoxy) methyl]-2-oxazoline and 2-(imino)-5-[3,4-dichlorophenoxy)methxyl]-3-methyl-2-oxazolidine hydrobromide are prepared by the reaction of a substituted 1-amino-3-(3,4-dihalophenoxy)-2-propanol with cyanogen bromide. The novel compounds are useful as antimicrobials for the control of bacteria and fungi.

3,637,727
PROCESS FOR PRODUCING N-CARBOXY ANHYDRIDES OF AMINO ACIDS
Yasuo Fujimoto and Keizo Tatsukawa, Machida-shi, and Yoichi Koiwa, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Chiyoda-ku, Tokyo, Japan
No Drawing. Filed May 15, 1968, Ser. No. 729,460
Claims priority, application Japan, May 17, 1967, 42/30,877; May 22, 1967, 42/32,107, 42/32,108
Int. Cl. C07d *85/34*
U.S. Cl. 260—307 B **20 Claims**

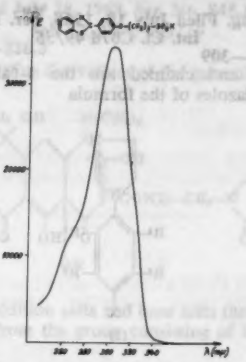
A process for the preparation of highly pure N-carboxy anhydrides of amino acids which comprises suspending an amino acid in an inert organic solvent and reacting with phosgene in the presence of a metal salt, metal oxide, or a powdered metal or alloy at a temperature of at least 50° C. The reaction may also be effected in the absence of the additive if it is carried out in a solvent comprising an aromatic nitro compound or an aromatic halogen compound, or if it is conducted at a temperature above 60° C. in a mixed hydrocarbon solvent of an aliphatic hydrocarbon and an aromatic hydrocarbon, the latter being a petroleum fraction.

3,637,728
2-PHENYLBENZOXAZOLE DERIVATIVES
Christian Luethi, Muenchenstein, Switzerland, assignor to Ciba Limited, Basel, Switzerland
Filed June 4, 1969, Ser. No. 830,283
Claims priority, application Switzerland, June 11, 1968, 8,659/68
Int. Cl. C07d *85/00*
U.S. Cl. 260—307 **3 Claims**

2-phenylbenzoxazoles of the formula



wherein R_1 stands for hydrogen, alkyl, phenylalkyl or cycloalkyl, R_2 stands for hydrogen or alkyl, m is 3 or 4



and X a cation. These compounds are valuable ultraviolet absorbers for cosmetic purposes.

3,637,729
PERFLUOROALKANESULFONAMIDES N-SURSTITUTED BY HETEROCYCLIC GROUPS
Joseph Kenneth Harrington, Edina, Donald C. Kvam, North Oaks, Arthur Mendel, Vadnais Heights, and Jerry E. Robertson, North Oaks, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Continuation-in-part of abandoned application Ser. No. 588,338, Oct. 21, 1966. This application June 30, 1969, Ser. No. 837,932
Int. Cl. A01n *9/22, 9/28*; C07d *55/06*
U.S. Cl. 260—308 R **2 Claims**

N-substituted perfluoroalkanesulfonamides in which the sulfonamide nitrogen substituent is a heteroatom-containing group selected from pyridinyl, quinolinyl, pyrazolyl, thiazolyl, quinoxalinylphenyl, imidazo[1,2a]pyridinylphenyl, imidazo[1,2a]pyrimidylphenyl, benzoxazolyl and 1,2,4-triazolyl, which can be unsubstituted or which can carry certain substituents.

Also included are salts of these compounds, compositions containing the compounds of the present invention and processes for their preparation and use. The compounds are active as herbicides and plant growth modifiers.

3,637,730
TETRAHYDROBENZIMIDAZOLES
Berthold Halpern, Menlo Park, Calif., assignor to Syntex Corporation, Panama, Panama
No Drawing. Filed Dec. 1, 1966, Ser. No. 598,190
Claims priority, application Mexico, Dec. 18, 1965, 86,307
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 **8 Claims**

4,5,6,7 - tetrahydrobenzimidazoles prepared by the reaction of a cyclic 1,3-diketone with an α-amino acid ester hydrohalide followed by treatment with base to obtain an N - (cycloalk - 2 - en - 1 - one - 3 - yl)α-amino acid which is converted into N-(α-isonitrosocycloalkan - 1 - one - 3-ylidene)α-amino acid by treatment with nitrous acid or nitrosyl chloride which is cyclized to a 4,5,6,7-tetrahydrobenzimidazole having hypotensive activity.

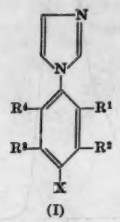
3,637,731

1-(ALKYLSUBSTITUTED PHENYL)IMIDAZOLES USEFUL IN ACTH RESERVE ASSAY

Alexander Lawrence Johnson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 18, 1968, Ser. No. 745,672
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 **7 Claims**

Described and claimed are the 1-(alkylsubstituted-phenyl) imidazoles of the formula



(I)

wherein at least one of R^1 through R^4 is a saturated lower aliphatic group of up to six carbon atoms, the remaining R groups being hydrogen, and X is hydrogen with the proviso that X can be lower alkyl when both R^1 and R^4 are lower alkyl.

The compounds of this invention possess selective activity as inhibitors of steroid hydroxylation in the adrenal cortex and are thus useful in the ACTH reserve assay.

3,637,732

SATURATED HYDROCARBON SUBSTITUTED IMIDAZOLYL PHOSPHORUS COMPOUNDS

Paul B. Budde and Henry Tolkmith, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Feb. 1, 1966, Ser. No. 523,852, now Patent No. 3,466,369, dated Sept. 9, 1969. Divided and this application Apr. 24, 1969, Ser. No. 835,846
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 **4 Claims**

Imidazoyl phosphorothioates wherein the phosphorus atom additionally bears (a) an alkyl or cyclohexyl group and (b) a heteroparaffinic amido, imidazole, or di-substituted amino group in which one substituent is methyl or ethyl and the other substituent is lower alkyl, phenylloweralkyl, furfuryl, tetrahydrofurfuryl, or 4-pyridylmethyl, the imidazole radicals being optionally substituted with one member selected from lower alkyl and phenyl. These compounds are useful as fungicides.

3,637,733

2-BENZIMIDAZOLECARBAMIC ACID ESTERS FROM o-PHENYLENEDIAMINES, CYANAMIDE AND DIALKYL CARBONATES

Rudolf Schlatter, Chadds Ford, Pa., and Charles D. Adams, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 674,739, Oct. 12, 1967, which is a continuation-in-part of application Ser. No. 594,384, Nov. 15, 1966. This application Nov. 21, 1968, Ser. No. 777,919
Int. Cl. C07d *49/38*
U.S. Cl. 260—309.2 **3 Claims**

A process for making 2-benzimidazolecarbamic acid, alkyl esters by reacting cyanamide or a cyanamide salt with a dialkyl carbonate at a temperature between 30° C. and 120° C. to form an alkyl cyanocarbamate salt, then reacting the alkyl cyanocarbamate salt with an o-phenylenediamine at a temperature between 40° and 130° C. to form the desired product and recovering it from the reaction mixture.

The 2-benzimidazolecarbamic acid, alkyl esters, are useful as intermediates in the preparation of dialkyl esters of 2-aminobenzimidazole-1-carboxylic acids, which are excellent fungicides.

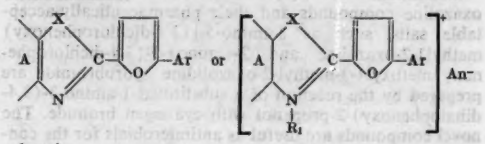
3,637,734

BENZIMIDAZOLYLFURAN COMPOUNDS

Horst Harnisch, Cologne, Buchheim, and Roderich Raue, Leverkusen-Wiesdorf, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of application Ser. No. 517,062, Dec. 28, 1965. This application June 17, 1969, Ser. No. 838,011
Claims priority, application Germany, Dec. 31, 1964, F 44,856; Aug. 4, 1965, F 46,812
Int. Cl. C07d *49/38, 85/48*
U.S. Cl. 260—309.2 **1 Claim**

Optical brightening composition and method of brightening synthetic materials such as polyacrylonitrile and polyamides by applying as active component a compound of the formula:



wherein

A is a residual member of an aromatic ring system condensed with the heterocyclic ring;

X is

wherein R stands for a member selected from the group consisting of hydrogen, alkyl, chloroalkyl, cyanoalkyl, alkenyl, cycloalkyl and aralkyl;

Ar is an aromatic radical;

R_1 is a member selected from the group consisting of an alkyl, alkenyl, cycloalkyl and aralkyl radical; and

An^- is an anion.

3,637,735

SILYLMETHYL THIOPSEUDOUREA SALTS

Sandor Barcza, West Orange, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Feb. 24, 1970, Ser. No. 13,819
Int. Cl. C07d *49/39*; C07f *7/10*
U.S. Cl. 260—309.6 **3 Claims**

The compounds are tri-substituted silylmethyl thiopseudourea salts, e.g., 1,3-dimethyl-2-trimethylsilylmethylthiopseudourea hydrochloride, and are useful as anti-inflammatory agents and analgesics. Said compounds are obtainable by reacting a suitable trisubstituted halomethylsilane with a thiourea.

3,637,736

N'-SUBSTITUTED-6-NITROINDAZOLES

Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.

No Drawing. Filed Oct. 25, 1966, Ser. No. 589,235
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 C **2 Claims**

N'-Substituted-6-nitroindazoles are useful in the control of the growth of undesirable fungi, bacteria, plants and insects. Among hte most active of these compounds are N'-thiocyanatomethyl-6-nitroindazole and N'-chloromethyl-3-chloro-6-nitroindazole.

3,637,737

3-AMINOMETHYLPYRAZOLINONES

Bernard Loev, Broomall, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Jan. 24, 1969, Ser. No. 793,890
Int. Cl. C07d *49/14*
U.S. Cl. 260—310 A 2 Claims

3-aminomethylpyrazoles having anti-hypertensive activity are prepared from the reaction of a lower alkyl aminoacetoacetate with a hydrazine.

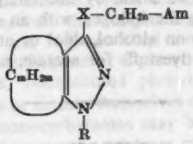
3,637,738

CYCLOALKANO[c]PYRAZOLE ETHERS

Heinz Werner Gschwend, Millburn, and Neville Finch, West Orange, N.J., assignors to Ciba Corporation, Summit, N.J.

No Drawing. Continuation-in-part of application Ser. No. 762,338, Sept. 16, 1968. This application Feb. 12, 1969, Ser. No. 798,801
Int. Cl. C07d *49/18*
U.S. Cl. 260—311 7 Claims

Basic 3-ethers of cycloalkano[c]pyrazoles, e.g. those of the formula



R=aralkyl or aryl
Am=an amino group
X=O or S
m=3–7
n=2–7

acyl derivatives, quaternaries and salts thereof are antidepressants.

3,637,739

TETRAHYDROTETRAAZAPORPHINE DYESTUFFS

Bernard Lamure, Lyon, France, assignor to Societe Rhodiaceta, Paris, France

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,584
Claims priority, application France, Mar. 29, 1968, 146,471
Int. Cl. C07d *27/76*
U.S. Cl. 260—314 5 Claims

The invention provides novel tetrahydrotetraazaporphine dyestuffs containing carboxylic ester groups which can be used to colour polyamides and polyesters by incorporation in the polymer molecule.

3,637,740

AMINOBENZOCYCLOALKANE COMPOUNDS

Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,056
Int. Cl. C07c *87/100*; C07d *27/02*
U.S. Cl. 260—326.5 M 18 Claims

Substituted 1,2,3,4 - tetrahydro-1-naphthylamines and substituted 1-aminoindanes, their acid addition salts and their racemic and *d*- and *l*-forms are useful in the field of mental health as anti-anxiety agents and/or as antidepressants. N,N-dimethyl-5-methoxy-8-chloro-1,2,3,4-tetrahydro-1-naphthylamine and 1-(5-methoxy-8-acetyl-1,2,3,4-tetrahydro-1-naphthyl)pyrrolidine are preferred embodiments.

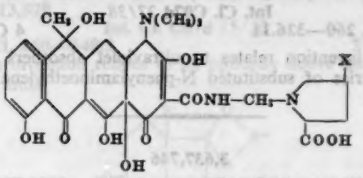
3,637,741

TETRACYCLINE DERIVATIVES

Takeshi Mayama, Kawasaki-shi, Taro Miura, Yokohama-shi, and Kazuo Saito, Fujisawa-shi, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed July 28, 1969, Ser. No. 845,183
Int. Cl. C07c *103/19*
U.S. Cl. 260—326.3 4 Claims

New tetracycline derivatives of the general formula



and the acid-addition salts and base salts thereof, wherein X is selected from the group consisting of hydrogen and hydroxyl.

3,637,742

PYRROLIDINE COMPOUNDS WITH UNSATURATED SUBSTITUENT

Ian Moyle Lockhart, Egham, England, assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,988
Claims priority, application Great Britain, Feb. 7, 1969, 6,880/69
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.5 M 6 Claims

m-(3-alkyl-3-pyrrolidinyl)phenol compounds substituted at the 1-position of the pyrrolidine ring by an unsaturated hydrocarbon or an unsaturated chlorohydrocarbon substituent; esters thereof; and salts of the foregoing compounds. These compounds are pharmacological agents and have analgesic and morphine antagonist properties. The phenols can be prepared by cleavage of the corresponding phenolic ethers or by reduction of a 1-(unsaturated acyl) derivative. The esters can be prepared by esterification of the phenols.

3,637,743

PRODUCTION OF 2-PYRROLIDONES

Frank R. Prince, Los Angeles, Calif., assignor to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Filed Aug. 28, 1968, Ser. No. 755,813
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.5 FN 6 Claims

2-pyrrolidone (γ-butyrolactam) and N-substituted-2-pyrrolidones are produced in one step by the carbonylation of allyl chloride in the presence of ammonia in a two-phase solvent system, e.g., benzene and water.

3,637,744

INDOLEAZOCINES

John P. Yardley, King of Prussia, and Herchel Smith, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Apr. 4, 1969, Ser. No. 813,712
Int. Cl. C07d *27/54*
U.S. Cl. 260—326.9 6 Claims

This invention is concerned with 2,3,4,5,6,7-hexahydro-1H-indolo[5,4-b]azocines, derivatives thereof and their acid addition salts which are useful as central system depressants. Further, some of these compounds are useful intermediates in the preparation of other such compounds.

3,637,745

N-(β-CYANOVINYL)-INDOLINES

Karl-Heinz Heller, Moers, Manfred Kreuder, Krefeld, and Karl Merz, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 29, 1967, Ser. No. 642,132

Claims priority, application Germany, June 15, 1966, F 49,471

Int. Cl. C07d *27/38*

U.S. Cl. 260—326.11 4 Claims

This invention relates to ultraviolet absorbers based on a series of substituted N-phenylaminoethylene compounds.

3,637,746

PROCESS FOR PREPARING N-ARYL-α-OXOCYCLOPOLYMETHYLENE AMINES AND RELATED COMPOUNDS

Peter H. L. Wei, Upper Darby, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 10, 1968, Ser. No. 735,540

Int. Cl. C07d *27/08*

U.S. Cl. 260—326.5 1 Claim

The invention is directed to N-aryl-α-oxocyclopolymethylene amines and N-aryl-α-oxo-α'-iminocyclopolymethylene amines which are central nervous system depressants.

3,637,747

3-(2-AMINOPHENYL) INDOLE DERIVATIVES

Jules Freedman, Thiensville, and Claude I. Judd, Mequon, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Apr. 30, 1969, Ser. No. 820,675

Int. Cl. C07d *25/76*

U.S. Cl. 260—326.13 R 9 Claims

The compounds are 3-(2-aminophenyl) indoles which are useful as anticonvulsant agents and central nervous system depressants. The compounds may also be used as intermediates in the preparation of pickling agents, mothproofing agents and wood preservatives. Representative of the compounds disclosed is 3-(2-acetamido-5-chloro)-phenylindole.

3,637,748

HETERYL-METHANE COMPOUNDS

Hubertus Psaar and Roderich Raue, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

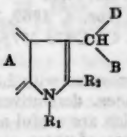
No Drawing. Filed Apr. 5, 1968, Ser. No. 719,222

Claims priority, application Germany, Apr. 14, 1967, F 52,123

Int. Cl. C07d *27/56*

U.S. Cl. 260—326.15 7 Claims

A heteryl methane compound of the formula



wherein R_1 and R_2 stand for members selected from the class consisting of hydrogen, lower alkyl, cycloalkyl, aralkyl and aryl, A stands for the residual part of an aromatic ring system, B stands for a carbocyclic or heterocyclic ring system being linked with the CH group via a cyclic carbon atom of said carbocyclic or heterocyclic ring system, D stands for a carbocyclic or heterocyclic ring system being linked with the CH group via a cyclic carbon atom of said carboxylic or heterocyclic ring system, said heteryl methane compound being free of sulphonic acid groups and are valuable dyestuff intermediates.

3,637,749

α-CYANO-1,3-DITHIOLANE - $\Delta^{2,\alpha}$ - THIONOACETIC ACID DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Brian Russ O'Connor, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 13, 1968, Ser. No. 752,131

Int. Cl. C07d *71/00, 73/00*

U.S. Cl. 260—327 M 3 Claims

Halocyanoethylene reacts with alkylene trithiocarbonates to form α-cyano-1,3-dithiolane-$\Delta^{2,\alpha}$-thionacetyl halides and α-cyano-1,3-dithiane-$\Delta^{2,\alpha}$-thionacetyl halides. Further products can be made by interchange of the halogen or by reacting the halogen with an active hydrogen compound such as an alcohol, thiol or amine. The products are useful as dyestuffs for acetate, acrylic and polyamide fibers.

3,637,750

α,α'-TRIMETHYLSILYL BUTYL, TRIMETHYLBUTYRYLTHIOPHENE

Edward V. Wilkus, Albany, and Abe Berger, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Division of application Ser. No. 753,328, Mar. 29, 1968, now Patent No. 3,489,781, which is a division of application Ser. No. 591,117, Nov. 1, 1966, now Patent No. 3,410,822, which in turn is a continuation-in-part of application Ser. No. 408,367, Nov. 2, 1964, now Patent No. 3,301,817. Divided and this application Oct. 20, 1969, Ser. No. 871,238

Int. Cl. C07d *63/12*

U.S. Cl. 260—332.3 C 1 Claim

The present invention relates to carbonyl-containing organosilicon materials useful for making elastomers having improved resistance to swell in fluid hydrocarbons. More particularly, the present invention relates to a method of acylating an aryl nucleus with certain carboxylic acid halides and to the resulting silicon containing materials obtained therefrom.

3,637,751

PRODUCTION OF TRIOXANE

Hugo Fuchs and Heinrich Sperber, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Apr. 15, 1970, Ser. No. 28,958

Claims priority, application Germany, Apr. 17, 1969, P 19 19 495.7

Int. Cl. C07d *19/00*

U.S. Cl. 260—340 1 Claim

Manufacture of trioxane from formaldehyde with the aid of an acid catalyst in the presence of an oily phase which is capable of preventing the separation of paraformaldehyde and which consists of a phthalic ester.

3,637,752

METHYLENEDIOXY BENZENE ETHERS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed May 18, 1970, Ser. No. 38,503
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 5 Claims

Method for the control of bugs of the family Miridae using methylenedioxyphenyl ethers and compositions therefor.

3,637,753

MONOCARBAMATES AND N-LOWER ALKYL OR N-PHENYL MONOCARBAMATES OF SUBSTITUTED AND UNSUBSTITUTED 1-PHENYL-2,2-DIALKYL-1,3-DIHYDROXYPROPANES

Kurt Kulka, New York, N.Y., assignor to Fritzsche Dodge & Olcott Inc., New York, N.Y.

No Drawing. Division of application Ser. No. 423,327, Jan. 4, 1965, now Patent No. 3,415,844, which is a continuation-in-part of applications Ser. No. 282,549, May 23, 1963, and Ser. No. 284,331, May 31, 1963. This application Sept. 23, 1968, Ser. No. 761,797
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 25 Claims

The monocarbamates of this invention manifest tranquilizing effects in animals. When administered to animals they produce narcosis that emphasizes relaxation. The monocarbamate and N-lower alkyl monocarbamates are produced by the utilization of 1-phenyl-2,2-dialkyl-1,3-dihydroxypropanes, 1-substituted phenyl-2,2-dialkyl-1,3-dihydroxypropanes or certain derivatives of such dihydroxypropanes. The monocarbamates may be primary or secondary monocarbamates or mixtures of them, depending upon the method employed to produce them.

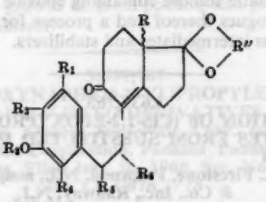
3,637,754

9,10-SECOGONA-1,3,5(10),8(14)-TETRAENE-9-ONES

Robert Bucourt, Clichy-sous-Bois, Michel Vignau, Neuilly-sur-Seine, and Jean Raynal, Paris, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Original application Aug. 21, 1967, Ser. No. 661,786, now Patent No. 3,506,693, dated Apr. 14, 1970. Divided and this application Jan. 21, 1970, Ser. No. 8,119
Claims priority, application France, Aug. 25, 1966, 74,179; Nov. 25, 1966, 85,043; July 7, 1967, 113,579
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 3 Claims

This invention relates to an optically active seco-gonatetraene of the formula



where R is an alkyl having 1 to 3 carbon atoms, R″ is a lower alkylene having 2 to 4 carbon atoms, R_1, R_2 and R_4 are substituents selected from the group consisting of hydrogen, lower alkyl and lower alkoxy, R_3 is lower alkyl, R_5 and R_6 are substituents selected from the group consisting of hydrogen, α-lower alkyl and β-lower alkyl and the wavy line indicates either the α-configuration or the β-configuration, which are used as intermediates in the preparation of optically active 13-alkyl gonapentaenes.

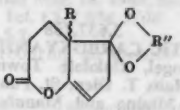
3,637,755

PYRANOCYCLOPENTENEDIONE KETAL

Robert Bucourt, Clichy-sous-Bois, Michel Vignau, Neuilly-sur-Seine, and Jean Raynal, Paris, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Original application Aug. 21, 1967, Ser. No. 661,786, now Patent No. 3,506,693, dated Apr. 14, 1970. Divided and this application Jan. 21, 1970, Ser. No. 8,120
Claims priority, application France, Aug. 25, 1966, 74,179; Nov. 25, 1966, 85,043; July 7, 1967, 113,579
Int. Cl. C07d *15/10*
U.S. Cl. 260—340.3 3 Claims

This invention relates to an optically active lactone of the formula



where R is alkyl having 1 to 3 carbon atoms, R″ is a lower alkylene having 2 to 4 carbon atoms and the wavy line indicates either the α or β configuration, which may be used in the preparation of 13-alkyl gonapentaenes.

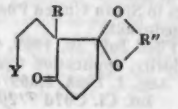
3,637,756

DIOXASPIROALKANONE PROPIONIC ACIDS, ESTERS AND NITRILES THEREOF

Robert Bucourt, Clichy-sous-Bois, Michel Vignau, Neuilly-sur-Seine, and Jean Raynal, Paris, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Original application Aug. 21, 1967, Ser. No. 661,786, now Patent No. 3,506,693, dated Apr. 14, 1971. Divided and this application Feb. 6, 1970, Ser. No. 13,217
Claims priority, application France, Aug. 25, 1966, 74,179; Nov. 25, 1966, 85,043; July 7, 1967, 113,579
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 9 Claims

This invention relates to a cyclopentylpropionyl ketal of the formula



wherein R is an alkyl having 1 to 3 carbon atoms, Y is a substituent selected from the group consisting of —COO— lower alkyl —COOH and —C≡N and R″ is a lower alkylene having 2 to 4 carbon atoms, which is used as intermediates in the preparation of 13-alkyl gonapentaenes.

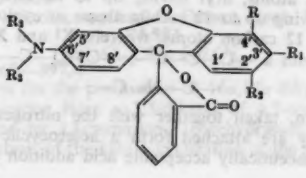
3,637,757

DIETHYLAMINO FLUORANS

Chao-Han Lin, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Jan. 21, 1969, Ser. No. 792,325
Int. Cl. C07d *21/00*
U.S. Cl. 260—343.3 3 Claims

A chromogenic material of normally colorless form is disclosed, having a structural formula:



wherein one of R, R_1 and R_2 represents a chemical radical from a group comprising —CO—R_4, —O—R_4, and —CO—O—R_4 wherein R_4 represents hydrogen, aryl radicals, and alkyl radicals; the remaining others of R, R_1 and R_2 represent hydrogen, halogen, and alkyl radicals; and R_3 represents hydrogen and alkyl radicals having less than five carbon atoms—said materials assuming a colored form upon reactive contact with a Lewis acid molecule. Examples include 2'-benzyloxy-6'-diethylaminofluoran; 6'-diethylamino - 2' - formylfluoran; 2'-carbomethoxy-6'-diethylaminofluoran; and 2'-benzoyl-6'-diethylamino-4'-methylfluoran.

3,637,758

AROMATIC CARBOXYANHYDRIDES

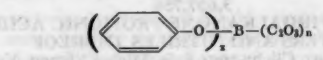
Herward A. Vogel, Oakdale Township, Washington County, and Hans T. Oien, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Original application Apr. 8, 1966, Ser. No. 541,124, now Patent No. 3,431,240, dated Mar. 4, 1969. Divided and this application Dec. 23, 1968, Ser. No. 819,501

Int. Cl. C07d *7/00*

U.S. Cl. 260—345.2 13 Claims

Aromatic carboxyanhydrides of the formula



wherein x is 1–2, B is aromatic and contains from 6 to 13 carbon atoms, C_2O_3 is an anhydride group of which the carbonyl carbon atoms are bonded directly to aromatic carbon atoms in B and n is 1–2.

3,637,759

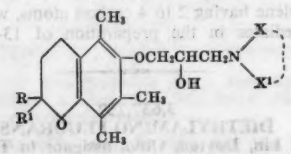
CHROMANES

Jaroslav Welchet, Ludvik Blaha, Jarmila Hodorova, Antonin Diabac, and Vaclav Trcka, Prague, Czechoslovakia, assignors to Spofa United Pharmaceutical Works, Prague, Czechoslovakia

No Drawing. Filed July 30, 1969, Ser. No. 846,235
Claims priority, application Czechoslovakia, Aug. 1, 1968, 5,609/68
Int. Cl. C07d *7/20*

U.S. Cl. 260—345.5 7 Claims

Novel chromane derivatives characterized by cardiovascular actvity having the following formula:



wherein R represents hydrogen or straight or branched chain alkyl having from 1 to 16 carbon atoms, R^1 represents hydrogen or methyl, X^1 represents hydrogen, alkyl having 1 to 8 carbon atoms or aralkyl having up to 8 carbon atoms, X represents hydrogen, alkyl having 1 to 12 carbon atoms, aryl having up to 12 carbon atoms, aralkyl having up to 12 carbon atoms or cycloalkyl having up to 12 carbon atoms, wherein X^1 and X, possibly together with a —C—C—C—, —C—O—C— or

—C—N—C—

linkage can, taken together with the nitrogen atom to which they are attached form a heterocyclic ring, and the pharmaceutically acceptable acid addition salts.

3,637,760

COMPOUNDS OF FIVE AND SIX-MEMBERED CYCLIC ALPHA, BETA-UNSATURATED ETHERS

Rostyslaw Dowbenko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 671,990, Oct. 2, 1967. This application Jan. 19, 1970, Ser. No. 4,120

Int. Cl. C07d *7/04, 5/02*

U.S. Cl. 260—345.8 7 Claims

Compounds containing 2-tetrahydropyranyloxy groups or 2-tetrahydrofuranyloxy groups are formed by reacting carboxylic acid esters containing hydroxyl groups with 2,3-dihydropyran or 2,3-dihydrofuran. Preferred embodiments include 2-(2-tetrahydropyranyloxy)ethyl acrylate, 2-(2-tetrahydropyranyloxy)ethyl methacrylate, and butyl 2-(2-tetrahydropyranyloxy)ethyl fumarate. Homopolymers and interpolymers of the 2-tetrahydropyranyloxy and 2-tetrahydrofuranyloxy compounds with other ethylenic monomers are useful as films and coatings which cure very rapidly at low temperatures and are solvent resistant.

3,637,761

PROCESS FOR THE PREPARATION OF HIGH PURITY TRIMELLITIC ANHYDRIDE FROM TRIMELLITIC ACID BY THE CHEMICAL REDUCTION OF NITRO-COMPOUND IMPURITIES PRIOR TO DEHYDRATION AND DISTILLATION

Tsutomu Kuwata, Tokyo, and Syoichi Nagato and Tadashi Yamada, Iruma-gun, Japan, assignors to Daicel Ltd., Higashi-ku, Osaka, Japan

No Drawing. Filed Mar. 10, 1969, Ser. No. 805,831
Claims priority, application Japan, Mar. 14, 1968, 43/16,990
Int. Cl. C07c *63/02*

U.S. Cl. 260—346.3 9 Claims

An impure trimellitic acid solution containing nitro compounds as impurities is subjected to a reduction treatment, following which it is dehydrated and distilled to obtain highly pure trimellitic anhydride.

3,637,762

CYCLOALIPHATIC SULFIDES CONTAINING EPOXIDE GROUPS

Hanswilli von Brachel, Offenbach am Main, and Karl Hintermeier, Frankfurt am Main, Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main, Fechenheim, Germany

No Drawing. Filed Nov. 21, 1967, Ser. No. 684,618
Claims priority, application Germany, Nov. 26, 1966, C 40,814
Int. Cl. C07d *1/18*

U.S. Cl. 260—348 R 2 Claims

Cycloaliphatic sulfides containing epoxide groups, lower alkyl homologues thereof and a process for their production useful as intermediates and stabilizers.

3,637,763

PREPARATION OF (CIS-1,2-EPOXYPROPYL) PHOSPHONATES FROM SUBSTITUTED IMINO COMPOUNDS

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Jan. 2, 1969, Ser. No. 789,060
Int. Cl. C07f *9/38*

U.S. Cl. 260—348 4 Claims

A process for the preparation of a (cis-1,2-epoxypropyl)-phosphonic acid diester which comprises cyclizing a [1 - hydroxy-2-methyl-3-(substituted imino)-pentyl]-phosphonic acid diester or a [1(1-hydroxyethyl)-2-(substituted imino)] phosphonic acid diester in the presence of base. The (cis-1,2-epoxypropyl)-phosphonic acid diesters can be converted to (cis-1,2-epoxypropyl)-phosphonic acid and its salts. (Cis-1,2-epoxypropyl)-phosphonic acid and its salts are active antibacterial agents.

3,637,764

α-NITROEPOXIDES AND METHOD OF PREPARING SAME

Howard Newman, Monsey, and Robert Bruce Angier, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Feb. 24, 1969, Ser. No. 801,802
Int. Cl. C07d 1/00, 1/06
U.S. Cl. 260—348 1 Claim

This disclosure describes compounds of the class of α-nitroepoxides useful as chemical intermediates and antifungal agents.

3,637,765

METHOD FOR THE PREPARATION OF (CIS-1,2-EPOXYPROPYL)-PHOSPHONIC ACID AND DERIVATIVES

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 796,173, Feb. 3, 1969. This application Jan. 16, 1970, Ser. No. 3,515
Int. Cl. C07f 9/38, 9/40, 9/42, 9/44
U.S. Cl. 260—348 R 12 Claims

A method for the preparation of (cis-1,2-epoxypropyl) phosphonic acid and the salt, ester and amide derivatives thereof, which comprises treating a 1-propenylphosphonate, 1-propenylphosphonic dihalide or 1-propenylphosphonic diamide which is substituted by a leaving group, with a base. Suitable leaving groups include, for example, the sulfonium, sulfoxonium, ammonium or phosphonium cation. The (cis-1,2-epoxypropyl)phosphonic acid product thus obtained and its salts are antibiotics which have utility as antibacterials in inhibiting the growth of gram-negative and gram-positive pathogenic bacteria.

3,637,766

METHOD FOR THE PREPARATION OF (CIS-1,2-EPOXYPROPYL)PHOSPHONIC ACID AND DERIVATIVES THEREOF

Edward J. Glamkowski, 681 E. Front St., and Meyer Sletzinger, 135 Rockview Ave., both of North Plainfield, N.J. 07060

No Drawing. Filed May 15, 1968, Ser. No. 729,446
Int. Cl. C07f 9/38, 9/40
U.S. Cl. 260—348 11 Claims

A method for the preparation of (cis-1,2-epoxypropyl) phosphonic acid and the salts and ester derivatives thereof which comprises treating a [(1-haloethoxy)halomethyl]phosphonic acid or a salt or ester thereof with (1) a reagent which releases iodide ion in solution and/or with (2) a metallic coupling agent capable of effecting epoxide-type ring closure. The (cis-1,2-epoxypropyl)phosphonic acid product thus obtained and its salts are antibacterial agents which have utility as antimicrobials in inhibiting the growth of gram-positive and gram-negative pathogenic bacteria.

3,637,767

2-(6′-METHOXYNAPHTH-2′-YL)PROPYLENE OXIDE AND 5′-HALO DERIVATIVES

Francisco S. Alvarez, Sunnyvale, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Filed July 30, 1968, Ser. No. 748,603
Int. Cl. C07d 1/18
U.S. Cl. 260—348 R 4 Claims

New compounds, 2-(6′-methoxynaphth-2′-yl)propylene oxide, 2-(6′-methoxynaphth-2′-yl)propionaldoxime, 2-hydroxy-2-(6′-methoxynaphth-2′-yl)propionitrile, 2-(6′-methoxynaphth-2′-yl)acrylonitrile, 2-(6′-methoxynaphth-2′-yl)acrylic acid, the corresponding 5′-halo compounds and 2 - (5′-halo-6′-methoxynaphth-2′-yl)propionaldehyde are useful intermediates in producing 2-(6′-methoxynaphth-2′-yl)propionic acid and the corresponding 5′-halo acids from 6-methoxy-2-acetylnaphthalene and the corresponding 5-halo compounds. The 2-propionic acids are anti-inflammatory, analgesic, anti-pyretic and anti-pruritic agents. The 2-propionaldehydes, obtained from the 2-acetyl compounds by way of the 2-propylene oxide, can be converted directly to the 2-propionic acids by way of the 2-propionaldoximes and the 2-propionitriles or more directly by Jones oxidation. Alternatively the 2-acrylonitriles, obtained from the 2-acetyl compounds by way of the 2-hydroxy-2-propionitrile, can be converted to the 2-propionic acid by way of the 2-acrylic acid or 2-propionitrile.

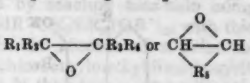
3,637,768

EPOXIDATION OF OLEFIN WITH AN OXOLANE

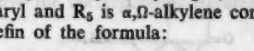
Richard D. Smetana, Beacon, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

No Drawing. Filed Mar. 18, 1969, Ser. No. 808,348
Int. Cl. C07d 1/08
U.S. Cl. 260—348.5 L 8 Claims

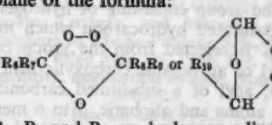
A method of producing an epoxide of the formula:



where R_1, R_2, R_3 and R_4 are hydrogen, alkyl, alkylaryl, arylalkyl or aryl and R_5 is α,Ω-alkylene comprising contacting an olefin of the formula:



with an oxolane of the formula:



where R_6, R_7, R_8 and R_9 are hydrogen, alkyl, aryl, alkylaryl and arylalkyl and R_{10} is α,Ω-alkylene in the presence of a molybdenum, tungsten or vanadium epoxidation catalyst.

3,637,769

QUINONEDIIMONIUM SALTS

Peter Vincent Susi, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 333,729, Dec. 26, 1963, which is a continuation-in-part of application Ser. No. 281,059, May 16, 1963. This application Dec. 21, 1967, Ser. No. 692,312
Int. Cl. C07c 119/12
U.S. Cl. 260—396 N 10 Claims

A defined class of N,N,N′,N′-tetraarylquinonediimonium as salts useful infrared absorbers is disclosed; especially the N,N,N′,N′-tetrakis(p-dialkylaminophenyl)-p-benzoquinonediimonium salt, such as N,N,N′,N′-tetrakis (p-diethylaminophenyl) - p - benzoquinonebis(imonium-hexafluoroantimonate. The diimonium salts are obtained by oxidation of N,N,N′,N′-tetraarylarylenediamines with silver salts or by electrolytic methods.

3,637,770

PROCESS FOR THE PRODUCTION OF 16α,17α-DIHYDROXY-19-NOR-PROGESTERONE

Julien Warnant, Neuilly-sur-Seine, Jean Jolly, Clichy-sous-Bois, and Robert Joly, Montmorency, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Original application May 23, 1967, Ser. No. 640,507. Divided and this application Dec. 31, 1969, Ser. No. 1,920
Claims priority, application France, Sept. 1, 1966, 74,982
Int. Cl. C07c 169/32
U.S. Cl. 260—397.4 8 Claims

A process for the production of 16α,17α-dihydroxy-19-nor-progesterone from a 3,5-diketal of 4,5-seco-estrane-3,5,17-trione by 17-cyanation, 16-dehydration, methylation, hydrolysis of the ketals, cyclization of the A ring and

hydroxylation of the Δ^{16} bond. The intermediates are also part of the disclosure.

3,637,771

7α-METHYL-$\Delta^{4,9}$-GONADIENES

Lucien Nedelec, Clichy-sous-Bois, and Jean-Claude Gasc, Bondy, France, assignors to Roussel-UCLAF, Paris, France

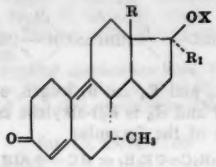
No Drawing. Continuation-in-part of application Ser. No. 602,112, Nov. 29, 1966. This application July 7, 1969, Ser. No. 839,711

Claims priority, application France, Dec. 2, 1965, 40,659

Int. Cl. C07c *169/20, 169/22*

U.S. Cl. 260—397.4 5 Claims

7α-methyl-13β-alkyl-$\Delta^{4,9}$-gonadienes of the formula



(I)

wherein R is an alkyl of 1 to 4 carbon atoms, R_1 is selected from the group consisting of hydrogen and saturated and unsaturated hydrocarbon which may be substituted and X is selected from the group consisting of hydrogen, acyl of an organic carboxylic acid of 1 to 18 carbon atoms, acyl of a substituted carbonic acid of 1 to 18 carbon atoms and aliphatic, 5 to 6 member cyclic and heterocyclic hydrocarbons which may be substituted and to novel processes for their preparation. The invention also relates to novel anabolic and/or androgenic compositions having reduced or no estrogenic activity.

3,637,772

ANTIOXIDANT COMPOSITIONS

Heinrich Klaui and Wolfgang Schlegel, Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Oct. 14, 1968, Ser. No. 767,474

Claims priority, application Switzerland, Oct. 27, 1967, 15,134/67

Int. Cl. A23d *3/04;* B01j *1/16*

U.S. Cl. 260—398.5 5 Claims

Antioxidant compositions containing a mixture of colamine and/or a higher fatty acid salt thereof and a higher fatty acid ester of ascorbic acid are disclosed.

3,637,773

PROCESS FOR MAKING MONOGLYCERIDES RESISTANT TO THE FORMATION OF FREE FATTY ACIDS

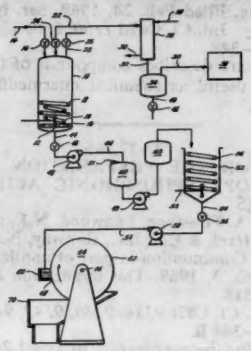
Paul Gibson, Robert L. Campbell, Jr., and Guan Smith, Sherman, Tex., assignors to Anderson, Clayton & Co., Houston, Tex.

Filed Sept. 4, 1969, Ser. No. 855,254

Int. Cl. C11b *5/00;* C11c *3/06*

U.S. Cl. 260—398.5 18 Claims

Monoglycerides are made by a conventional process of (i) reacting a normally solid fat and glycerol in the presence of a calcium hydroxide or calcium oxide catalyst, (ii) neutralizing the catalyst with phosphoric acid, and (iii) removing unreacted glycerol leaving reaction products containing monoglycerides. The resistance to the later formation of free fatty acids in the reaction products when the reaction products are solidified on a flaking roll or by passing droplets of the reaction products against air cooled below its dew point is increased by reacting the chloride or sulfate salts of sodium, potassium or lithium



in an aqueous solution with the reaction products after the neutralization of the catalyst and thereafter distilling off the water contained in the aqueous solution.

3,637,774

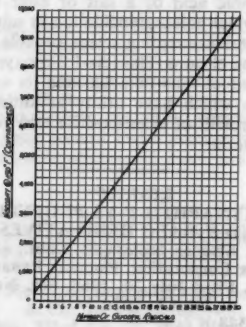
PROCESS FOR PREPARATION AND PURIFICATION OF POLYGLYCEROLS AND ESTERS THEREOF

Vigen K. Babayan, 374 W. Northfield Road, Livingston, N.J. 07039, and Henry Lehman, 51 Longview Road, Cedar Grove, N.J. 07009

Continuation of application Ser. No. 610,454, Jan. 19, 1967, which is a continuation of application Ser. No. 363,755, Apr. 29, 1964, which in turn is a continuation-in-part of applications Ser. No. 149,477, Oct. 5, 1961, and Ser. No. 357,258, Apr. 3, 1964. This application Nov. 3, 1969, Ser. No. 871,584

Int. Cl. C07c *4/12, 69/30, 67/06*

U.S. Cl. 260—410.6 8 Claims



The present invention is directed to polyglycerols and derivatives thereof and to novel compositions containing these compounds. It includes a novel procedure for decolorizing and deodorizing the polyglycerols and fatty acid esters thereof. More particularly, this invention relates to processes for the preparation of polyglycerols and derivatives thereof and to the use of these compounds over a broad spectrum of industrial and edible applications.

3,637,775
SOLUBLE COMPLEX ION METAL SILICATES
Paul C. Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed May 8, 1969, Ser. No. 823,169
Int. Cl. C07f 3/06
U.S. Cl. 260—429.9 16 Claims

Silicates prepared from (i) a metal-containing cation coordinated to a polyamine ligand and (ii) a source of silica are useful as film-forming agents.

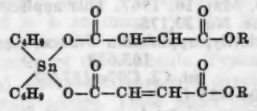
3,637,776
PROCESS FOR MAKING ANHYDROUS METAL ACETATES
Jay Y. Welsh, Catonsville, Md., assignor to Diamond Shamrock Corporation, Cleveland, Ohio
Filed Apr. 17, 1969, Ser. No. 816,927
Int. Cl. C07f 13/00, 15/02, 15/06
U.S. Cl. 260—429 5 Claims

Anhydrous acetate of manganese, iron, zinc, copper, cobalt or other heavy metal produced by vaporizing acetic acid from a body of substantially anhydrous liquid comprising acetic acid, condensing the vapor as a hot condensate, passing the hot condensate into and through a bed of pieces of the metal or metal oxide thereby forming some metal acetate, and returning the condensate together with dissolved acetate of the metal to said body of liquid. Because of the low level of solubility of the anhydrous metal salt the latter begins at an early stage to crystallize out of the returned solution of salt in acetic acid in the form of coarse crystals of the pure anhydrous salt. Finally, the salt crystals are separated from associated acid, and dried.

Said body of anhydrous liquid may include not only said acetic acid but also a higher-boiling acid which decomposes (upon heating) before it refluxes. In this event, the heating is effected under conditions to reflux acetic acid and to carry back to the body of liquid the acetate of the metal, whereupon a double exchange takes place in the body of liquid to obtain salt of said higher boiling acid.

3,637,777
ORGANOTIN BIS(MONOORGANO MALEATES)
Samuel Hoch, Brooklyn, N.Y., assignor to Tenneco Chemicals, Inc.
No Drawing. Filed Feb. 5, 1969, Ser. No. 796,900
Int. Cl. C07f 7/22; C08f 45/56
U.S. Cl. 260—429.7 4 Claims

Clear polyvinyl chloride resin compositions contain as stabilizer a liquid organotin compound having the structural formula



wherein each R represents a branched-chain alkyl group, an alkenyl group, or a hydroxy-alkenyl group, each of said groups having from 16 to 18 carbon atoms.

3,637,778
SYNTHESIS OF TETRAMETHYL LEAD
Ronald S. Bartlett, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Sept. 23, 1969, Ser. No. 860,311
Int. Cl. C07f 7/24
U.S. Cl. 260—437 R 8 Claims

A process for making tetramethyl lead in good yields using an aluminum-mercury catalyst is shown. The mixtures of aluminum-mercury or aluminum amalgams shown contain varying quantities of mercury, generally 0.2 to 50 percent by weight. The conventional methyl halide and sodium lead alloy feeds are employed. Temperatures are typically 100 to 120° C. and reactions are conducted in conventional autoclaves.

3,637,779
PREPARATION OF BETA-SILATHIURONIUM SALTS
Gary E. Le Grow, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed Apr. 23, 1970, Ser. No. 31,349
Int. Cl. C07f 7/02, 7/04
U.S. Cl. 260—448.2 E 3 Claims

Isothiuronium salts in which the sulfur is beta to silicon having the formula

$$X^{-+}(NY_2)_2CSCHR''CH_2SiR_n(OR')_m$$

are prepared by reacting beta-halo compounds of the formula $XCHR''CH_2SiR_n(OR')_m$ with thiourea or methyl thiourea in the absence of a polar solvent. For example, beta-chloroethylmethyldimethoxysilane is reacted with thiourea in the absence of a solvent at 105° C. for 3 hours to give the corresponding isothiuronium salt of the silane.

3,637,780
PROCESS FOR THE PRODUCTION OF ARYL-PHENYLMETHYLCHLOROSILANES
Andre Bazouin, Luzinay, and Marcel Lefort, Caluire, France, assignors to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed Mar. 24, 1970, Ser. No. 22,374
Claims priority, application France, Mar. 26, 1969, 6908928
Int. Cl. C07f 7/12
U.S. Cl. 260—448.2 P 7 Claims

Phenylarylmethylchlorosilanes (in which the aryl group is phenyl or C_1–C_6 alkylphenyl) are made by reaction of the corresponding aryldimethylchlorosilane with phenylmethyldichlorosilane in the liquid phase in the presence of aluminium chloride and at a temperature of 10–100° C., with the formation as by-product of dimethyldichlorosilane which is removed as vapour as it is formed.

3,637,781
PROCESS FOR THE PURIFICATION OF MIXTURES OF ORGANOCHLOROSILANES
Andre Bazouin, Luzinay, and Marcel Lefort, Caluire, France, assignors to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed Mar. 13, 1970, Ser. No. 19,507
Claims priority, application France, Mar. 17, 1969, 6907553
Int. Cl. C07f 7/20
U.S. Cl. 260—448.2 E 7 Claims

Mixtures of organosilicon compounds containing at least one chlorinated organosilicon compound are separated by adding an aprotic compound, or a precursor thereof, and either water or an alcohol to the mixture and then fractionally distilling the compound containing the smallest number of chlorine atoms bonded to the same silicon atom.

3,637,782
1-SILANAPHTHALENES
Sandor Barcza, West Orange, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Original application May 13, 1968, Ser. No. 728,802, now Patent No. 3,529,005, dated Sept. 15, 1970. Divided and this application Apr. 10, 1970, Ser. No. 31,448
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2 3 Claims

This invention relates to 1,2,3,4-tetrahydro 1-silanaphthalenes useful as intermediates in the preparation of tetracyclic silicon derivatives which are estrogenic agents.

3,637,783

COMPOSITION AND PROCESS FOR PREPARING FLEXIBLE POLYESTER BASED POLYURETHANE FOAMS

Loren A. Haluska, % Dow Corning Corp., Midland, Mich. 48640

No Drawing. Filed Sept. 25, 1968, Ser. No. 762,612
Int. Cl. C07f 7/08
U.S. Cl. 260—448.2 B 8 Claims

A composition is disclosed which consists essentially of a mixture of trimethylsilyl endblocked methylpolyoxyethylene siloxanes which composition is useful in the preparation of flexible polyester based polyurethane foams. Use of this composition minimizes problems of splitting and shrinkage of the foams, promotes uniformity of cell size, promotes compatibility of the reactants and catalyst, and allows wider processing and formulation latitude.

3,637,784

NOVEL AROMATIC PEROXY ESTERS

Desmond Sheehan, Hamden, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Sept. 23, 1965, Ser. No. 489,748, now Patent No. 3,470,103, dated Sept. 30, 1969. Divided and this application Oct. 11, 1968, Ser. No. 766,989
Int. Cl. C07c 73/10, 63/10; C09k 1/00
U.S. Cl. 260—453 R 6 Claims

New 9,10-substituted anthracenes which are useful in a chemiluminescent reaction.

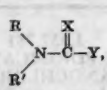
3,637,785

CATALYTIC PREPARATION OF AROMATIC ISOCYANATES

Eric Smith, Madison, and Ehrenfried H. Kober, Hamden, Conn., assignors to Olin Mathieson Chemical Corporation

No Drawing. Filed Feb. 10, 1969, Ser. No. 798,105
Int. Cl. C07c 119/04
U.S. Cl. 260—453 P 23 Claims

The process for preparing an organic isocyanate by reacting an organic nitro compound with carbon monoxide in the presence of a catalyst system comprising a halide of a noble metal and an amine compound of the formula:



where R and R′ are hydrogen, alkyl, aralkyl, aryl, alkaryl, and alkoxy aryl; X is sulfur, oxygen or NR·A, wherein A is an inorganic acid and Y is hydrogen, alkyl, aryl, alkaryl, alkoxyaryl, halogen, NRR′ or SR. Preferred amine compounds include N,N-diphenyl formamide, N,N-dimethyl formamide, N,N-ditolyl formamide, N-tolyl-N-naphthyl formamide, N,N-diphenyl acetamide, N,N-ditolyl acetamide, N-phenyl-N-xylyl acetamide, thiocarbanilide, N-xylyl-N′-phenyl thiourea, N-tolyl-N′-phenyl thiourea, diphenyl carbamyl chloride, 2-methyl-1,3-diphenyl-2-thiopseudo urea. The noble metal halide is preferably a halide of palladium, rhodium, iridium, rhenium, platinum, and mixtures thereof. The catalyst system may also include molybdenum trioxide or another metal oxide.

3,637,786

PREPARATION OF AROMATIC ISOCYANATES BY CATALYTIC CARBONYLATION OF CORRESPONDING NITRO COMPOUND

Eric Smith, Madison, Conn., assignor to Olin Mathieson Chemical Corporation

No Drawing. Filed Feb. 10, 1969, Ser. No. 798,177
Int. Cl. C07c 119/04
U.S. Cl. 260—453 P 19 Claims

The process for preparing an organic isocyanate by reacting an organic nitro compound with carbon monoxide in the presence of a catalyst system comprising a halide of a noble metal and a nitroso compound.

Preferred nitroso compounds include 1-nitroso-2-naphthol, 2-nitroso-1-naphthol, nitrosobenzene, and isonitroso acetophenone. The noble metal halide is preferably a halide of palladium, rhodium, iridium, rhenium, platinum, and mixtures thereof. The catalyst system may also include molybdenum trioxide or another metal oxide.

3,637,787

METHOD FOR THE PREPARATION OF ARYL ISOTHIOCYANATES

Antoine Theofiel Rasschaert and Gaston Jacob Benoy, Berchem, and Jan Frans Van Besauw, Brasschaat, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Dec. 27, 1966, Ser. No. 604,659
Int. Cl. C07c 161/04
U.S. Cl. 260—454 3 Claims

Monoarylthioureas are heated in an inert solvent while introducing hydrogen chloride to produce aryl isothiocyanates. The process is simple and provides good yields.

3,637,788

PROCESS FOR PRODUCING ISOTHIOCYANATES

Peter J. Werth, Jr., Orange, and Anthony R. Di Napoli, Cheshire, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed July 19, 1968, Ser. No. 745,995
Int. Cl. C07c 161/04
U.S. Cl. 260—454 4 Claims

A novel process is described for converting a primary amine to the corresponding isothiocyanate via the intermediate ammonium dithiocarbamate. The latter is prepared by reacting the amine with carbon disulfide in the presence of ammonium hydroxide in accordance with conventional methods and the dithiocarbamate is reacted with nitrous acid, advantageously formed in situ, at a pH not less than 5.0 to obtain the desired isothiocyanate. Advantages of the novel process are high yield, use of low cost reactants, and ease of operation.

3,637,789

PROCESS FOR THE PRODUCTION OF ALKENYL THIOESTERS

Pierre Legendre, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaine, Paris, France

No Drawing. Continuation of application Ser. No. 644,750, May 16, 1967. This application May 8, 1970, Ser. No. 33,175
Claims priority, application France, Apr. 21, 1967, 103,639
Int. Cl. C07c 153/07
U.S. Cl. 260—455 C 1 Claim

This invention relates to a process for the production of alkenyl thioesters of the general formula

$$R_1R_2C{=}CR_3CHR_4S{-}CO{-}R$$

by reacting compounds of the formula R—COSH and a base MOH with a compound of formula

$$R_1R_2C{=}CR_3{-}CH_4X$$

wherein R_1, R_2, R_3, and R_4 are members selected from hydrogen, chlorine, bromine, an alkyl group having 1–6 carbon atoms, and a phenyl group; wherein R represents an alkyl group having 1–6 carbon atoms, an alkenyl group having 1–16 carbon atoms, an aryl group from the group consisting of phenyl, toluyl, and cinnamyl; wherein X is halogen and wherein M represents a cation selected from sodium, potassium, calcium, ammonium, and the amine group of an organic base.

3,637,790

DIPHENYL THIOCARBONATES

Walter Traber, Riehen, and Anton G. Weiss, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed July 26, 1968, Ser. No. 747,801
Claims priority, application Switzerland, Aug. 1, 1967, 10,856/67
Int. Cl. C07c *154/00, 154/02*
U.S. Cl. 260—455 B 8 Claims

Certain diphenyl thiocarbonates in which one alcohol moiety consists of an optionally substituted phenoxyphenyl radical and the other alcohol moiety consists of an optionally substituted phenyl or phenoxyphenyl radical, are disclosed as useful antimicrobial agents.

3,637,791

FLUORINATED ESTERS AND PREPARATION THEREOF

Allen G. Pittman, El Cerrito, and William L. Wasley, Berkeley, Calif., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Division of application Ser. No. 704,206, Dec. 28, 1967, now Patent No. 3,465,050, which is a division of application Ser. No. 623,483, Jan. 9, 1967, now Patent No. 3,419,602, which in turn is a division of application Ser. No. 398,129, Sept. 21, 1964, now Patent No. 3,384,628. Divided and this application May 21, 1969, Ser. No. 826,655
Int. Cl. C07c *69/62, 69/54;* D06c *27/00*
U.S. Cl. 260—456 R 23 Claims

Fluorine-containing esters are prepared by reacting a fluorinated ketone with an alkali metal fluoride, and reacting the resulting alcoholate intermediate with an acyl halide.

3,637,792

POLYHALOALKYLPOLYTHIOALKYL SULFATE ESTERS

Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Division of application Ser. No. 588,009, Oct. 20, 1966, now Patent No. 3,519,672, which is a continuation-in-part of application Ser. No. 414,876, Nov. 30, 1964. Divided and this application Apr. 1, 1969, Ser. No. 834,188
Int. Cl. C07c *141/02*
U.S. Cl. 260—458 5 Claims

Esters and ethers of the formula

$$ROXS_mR'$$

where R' represents a polyhaloalkyl group having 1 to 2 carbon atoms and 3 to 5 halogens of atomic number 17 to 35, at least one of said halogens being bonded to the alpha carbon atom, X is alkylene of 1 to 4 carbon atoms and *m* is an integer varying from 2 to 3, and R is an organic radical which forms an ester or ether with the remainder of the molecule. Typical R groups are hydrocarbyl, phosphoro, carbonyl, oxycarbonyl, sulfate and sulfonate groups. These esters and ethers are useful as fungicides.

3,637,793

PROCESS FOR THE PREPARATION OF ETHIONIC ACID

August B. M. van Gysel and Jan E. F. Colle, Ostende, Belgium, assignors to UCB Societe Anonyme, Brussels, Belgium

No Drawing. Filed Jan. 15, 1968, Ser. No. 697,628
Claims priority, application Great Britain, Jan. 18, 1967, 2,598/67
Int. Cl. C07c *141/02*
U.S. Cl. 260—458 2 Claims

Preparation of ethionic acid from sulfur trioxide and ethanol in a proportion of 2 moles: 1 mole at a temperature between 40 and 100° C. using ethionic acid as a reaction medium. In a preferred embodiment, ethanol is introduced below the surface level and the sulfur trioxide above the level of the reaction medium.

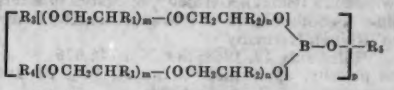
3,637,794

BORATE ESTERS PREPARED BY SUCCESSIVE REACTIONS OF BORIC ACID WITH GLYCOL MONOETHERS AND POLYOLS

Arthur W. Sawyer, Hamden, and David A. Csejka, Orange, Conn., assignors to Olin Mathieson Chemical Corporation

No Drawing. Filed July 14, 1967, Ser. No. 653,337
Int. Cl. C07f *5/04;* C09k *3/02*
U.S. Cl. 260—462 7 Claims

Borate esters of the formula:



where R_1 and R_2 are hydrogen or methyl; R_3 and R_4 are each an independently selected alkyl group having from 1 to 20 carbon atoms; R_5 is the organic residue exclusive of reactive hydroxyl groups of a polyol, *p* is an integer of from 2 to 6 inclusive and *n* and *m* are positive integers independently selected in each chain and whose sum in each chain is from 2 to 20, are prepared by successively reacting boric acid with a glycol monoether and a polyol. These esters are useful as stabilizers and corrosion inhibitors for lubricants and non-aqueous hydraulic fluids.

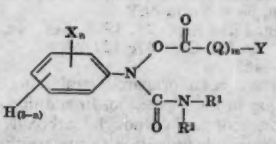
3,637,795

N-CYCLOALKYLOXYCARBONYLOXY-SUBSTITUTED N-PHENYLUREAS

John Krenzer, Oak Park, and Sidney B. Richter, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed Dec. 5, 1968, Ser. No. 781,584
Int. Cl. C07c *69/00, 154/00*
U.S. Cl. 260—463 4 Claims

This invention discloses new chemical compounds of the formula



wherein X is selected from the group consisting of alkyl, alkenyl, halogen, haloalkyl, alkoxy, alkylthio, nitro and dialkylamino; *n* is an integer from 0 to 5; R^1 and R^2 are independently selected from the group consisting of hydrogen and alkyl; Q is selected from the group consisting of oxygen, sulfur and alkylene; *m* is an integer from 0 to 1; and Y is cycloalkyl, optionally substituted with halogen or alkyl. This invention further discloses new herbicidal compositions comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the above description.

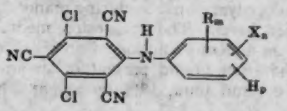
3,637,796

TRIMESONITRILES

Robert D. Battershell, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed Oct. 30, 1968, Ser. No. 772,052
Int. Cl. C07c *121/64*
U.S. Cl. 260—465 E 20 Claims

Trimesonitriles of the formula



where R is methyl, ethyl, trifluoromethyl, methoxy, nitro, cyano, and hydroxyl, X is halogen and H is hydrogen with *m* and *n* varying from 0 to 3, *p* from 0 to 5 and the sum of *m*, *n*, and *p* being 5 with the proviso that when methyl and chloro radicals are both present, *m* is 1 and *n* is 1 or 2 and when methyl and nitro radicals are both present, *m* is 2 and *n* is 0. The compounds are active fungicides, viricides, and bactericides.

3,637,797
PRODUCTION OF AROMATIC NITRILES

Martin Decker and Hanns-Helge Stechl, Ludwigshafen (Rhine), Christof Palm, Mannheim, and Gert Buerger, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 19, 1968, Ser. No. 746,076
Claims priority, application Germany, July 19, 1967, P 16 43 630.9
Int. Cl. C07c *121/02*
U.S. Cl. 260—465 C **10 Claims**

A process for the production of aromatic nitriles, in particular of phthalonitriles, from suitably alkyl-substituted aromatic hydrocarbons by catalytic oxidation with oxygen or oxygen-containing gases in the presence of ammonia at elevated temperature in the vapor phase using an aluminum oxide catalyst activated by metal oxide additives and containing 2 to 10% by weight vanadium (V) oxide, 1 to 10% by weight antimony(III) oxide, 0.02 to 2% by weight alkali metal oxide and, if desired, 0.1 to 4% by weight iron(III) oxide and/or 1 to 8% by weight tungsten(VI) oxide, the catalyst having been obtained by heating aluminum hydroxides or hydrated oxides to temperatures between 600 and 900° C.

3,637,798
CARBOXY 9-DICYANOMETHYLENE NITROFLUORENE

Theodore Sulzberg, South Piscataway, and Robert J. Cotter, Bernardsville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Sept. 23, 1968, Ser. No. 761,845
Int. Cl. C07c *121/66*
U.S. Cl. 260—465 **15 Claims**

Fluorenes have been prepared containing a dicyanomethylene group in the 9 position. In addition, the 2, 4, 5, and 7 positions contain carboxyl, carboxyl derivatives, nitro, or hydrogen substituents with the proviso that there is at least one carboxyl or carboxyl derivative in one of these positions. The electron accepting properties of these compounds and derived polymers make them useful for traps or filters for electron-rich compounds and as ultraviolet absorbers. These fluorene acceptor monomers and derived polymers, readily form charge-transfer complexes with a wide variety of Pi or Lewis bases which are useful as coloring agents, as electrical conducting materials and as ultra-violet absorbers.

3,637,799
SUSPENSION MEDIUM FOR NITRILOPOLYACETONITRILE

Jack L. Herz, Scarsdale, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Dec. 27, 1968, Ser. No. 787,573
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.5 A **3 Claims**

A suspension medium for forming a homogeneous slurry of nitrilopolyacetonitrile during manufacture thereof is described herein. The suspension medium may be described as an aqueous solution of an alkali metal inorganic phosphate compound present in an amount ranging between 0.1 and about 15% by weight. The presence of the alkali metal inorganic phosphates aids in maintaining a homogeneous slurry of the nitrilopolyacetonitriles.

3,637,800
POLYCHLORO- OR BROMOMUCONONITRILE

Dennis Ernest Burton, Saffron Walden, England, assignor to Fisons Pest Control Limited, Harston-Cambridgeshire, England

No Drawing. Filed Jan. 22, 1968, Ser. No. 699,305
Claims priority, application Great Britain, Jan. 26, 1967, 3,912/67
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.7 **4 Claims**

Compounds of the formula

$$NC—CR^1=CR^2—CR^3=CR^4—CN$$

wherein R^1, R^2, R^3, and R^4 are identical or different and represent hydrogen, bromine or chlorine provided that no more than one of the said groups is hydrogen. The compounds are active pesticides and are useful as fungicides, bactericides, insecticides and herbicides, and particularly as seed dressings, soil fungicides, etc.

3,637,801
CYCLOALIPHATIC COMPOUNDS

Robert C. Kuder, Excelsior, Minn., assignor to General Mills, Inc.

No Drawing. Continuation-in-part of application Ser. No. 570,772, Aug. 8, 1966. This application Mar. 13, 1969, Ser. No. 807,111
Int. Cl. C07c *69/74*
U.S. Cl. 260—468 B **2 Claims**

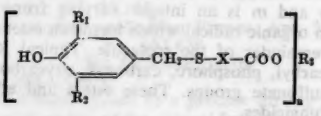
The compounds disclosed herein, which are useful in perfumes, flavor additives, odor ingredients, etc., are esters of alpha-[C_{10}-terpenyl]-alkanoic acid which are derived by esterification of alpha-[C_{10}-terpenyl] anhydride adducts.

3,637,802
HYDROXY-DIALKYLBENZYLTHIOALKANOATES

Heinz Eggensperger, Gadernheim over Bensheim, Volker Franzen, Heidelberg, Horst Muller, Furth-Odenwald, and Hans Stephan, Bensheim, Bergstrasse, Germany, assignors to Deutsche Advance Produktion G.m.b.H., Lautern am Odenwald, Germany

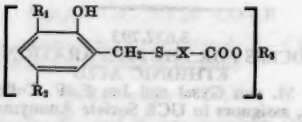
No Drawing. Filed Aug. 17, 1967, Ser. No. 661,213
Claims priority, application Germany, Aug. 18, 1966, D 50,874
Int. Cl. C07c *149/40*
U.S. Cl. 260—470 **7 Claims**

Compounds of the formula



(Ia)

and



(Ib)

are used as stabilizers for organic compositions. In the formulae:

n is an integer from 1 to 4
R_1 and R_2 are alkyl
R_3 for $n=1$ is a member of the group consisting of thioether, ether, and alkyl radicals and for $n=2—4$ an alkylene group, and
X is alkylene.

3,637,803

ALKYL METHYLSULFONYLALKYL BENZOATES

Tsung-Ying Shen and Clifford H. Shunk, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Application Aug. 1, 1966, Ser. No. 569,039, which is a continuation-in-part of application Ser. No. 458,435, May 24, 1965. Divided and this application May 22, 1969, Ser. No. 827,494

Int. Cl. C07c *147/06*

U.S. Cl. 260—470 1 Claim

Benzyl methyl sulfones having anti-inflammatory, antipyretic and analgesic activity and processes for their preparation. Also included are pharmaceutical compositions containing said benzyl methyl sulfones and methods of treating inflammation by administering these particular compositions to patients.

3,637,804

PHENYLALANINE DERIVATIVES AND PREPARATION THEREOF

Balthasar Hegedus, Binningen, and Paul Zeller, Allschwil, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

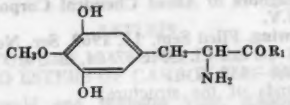
No Drawing. Continuation-in-part of application Ser. No. 684,623, Nov. 21, 1967. This application Feb. 12, 1968, Ser. No. 704,506

Claims priority, application Switzerland, Dec. 1, 1966, 17,197/66

Int. Cl. C07c *101/08*

U.S. Cl. 260—471 A 6 Claims

Compounds of the formula



in which R_1 is hydroxy, alkoxy, or a substituted or unsubstituted amino group, optical isomers (preferably the L-antipodes) thereof and pharmaceutically acceptable salts thereof, useful as hypotensive agents, along with methods for their preparation from the appropriate phenylalanine precursor, are disclosed.

3,637,805

2-AMINO-5-ALKOXYTEREPHTHALIC DERIVATIVES

Gottfried Burkhardt, Ludwigshafen (Rhine), and Erwin Hahn, Viernheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,482

Claims priority, application Germany, Aug. 18, 1967, P 16 43 645.6

Int. Cl. C07c *103/24*

U.S. Cl. 260—471 R 3 Claims

New 2 - acylamino - 5 - alkoxyterephthalic derivatives which are useful as comonomers for optical brightening and light stabilization.

3,637,806

PROCESS FOR PRODUCING 3-DIMETHYLAMINO 4-PHENYL-4-CARBETHOXY-Δ^1-CYCLOHEXENE

Gerhard Satzinger, Gundelfingen, Freiburg, Germany, assignor to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed Oct. 22, 1968, Ser. No. 769,718

Int. Cl. C07c *101/36*

U.S. Cl. 260—471 A 6 Claims

A process is described for producing 3-dimethylamino-4-phenyl-4-carbethoxy-Δ^1-cyclohexene by the reaction, at an elevated temperature, of crotonaldehyde and ethyl α-phenyl-β-dimethylamino propionate in the presence of a water-absorbing agent.

3,637,807

CATALYTIC PROCESS FOR THE PREPARATION OF PHENOXYBENZOATES, PHENYL ETHERS AND DERIVATIVES THEREOF

Warren W. Kaeding, Westfield, N.J., and Joseph J. Ligi, La Porte, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 9, 1969, Ser. No. 814,812

Int. Cl. C07c *69/78*

U.S. Cl. 260—473 13 Claims

When benzoic acid or a monosubstituted benzoic acid is subjected to air oxidation in the liquid phase in the presence of dissolved copper and magnesium or other promoter metal to produce the corresponding phenol, the phenoxybenzoic acid is also produced as a significant coproduct when a concentration of at least 0.1 mole of the phenol per mole of benzoic acid or its equivalent is maintained in the reaction mixture. The phenoxybenzoic acid is largely the ortho isomer. This product is chiefly useful as a chemical intermediate for making plasticizers or other known derivatives. Phenyl ethers are also formed by decarboxylation of the phenoxybenzoic acid.

3,637,808

BENZOIC ACID ESTERS OF 1-PHENYL-1-BENZYL-2-METHYL-3-DIMETHYLAMINO-PROPANOL

Luigi Fontanella, Milan, Italy, Emilio Testa, Ticino, Switzerland, and Giulio Maffii, Milan, Italy, assignors to Lepetit S.p.A.-Gruppo per la Ricerca Scientifica e la Produzione Chimica Formaceutica, Milan, Italy

No Drawing. Filed Jan. 22, 1968, Ser. No. 699,312

Claims priority, application Great Britain, Feb. 17, 1967, 7,774/67

Int. Cl. C07c *93/00*

U.S. Cl. 260—477 4 Claims

Esters of 1-phenyl-1-benzyl-2-methyl-3-dimethylaminopropanol with benzoic acid and derivatives thereof. These compounds are useful as coronary-vasodilators.

3,637,809

ANTIOXIDANTS

Eduard K. Kleiner, Dobbs Ferry, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed July 5, 1968, Ser. No. 742,701

Int. Cl. C07c *149/00*

U.S. Cl. 260—479 S 9 Claims

Organic materials, particularly synthetic polymers such as polypropylene are protected against oxidation in air, thermal degradation or deterioration by including, in such substances, a stabilizing amount of antioxidant. The antioxidant is obtained by reacting (a) an α,β-unsaturated ester of a hindered hydroquinone and (b) hydrogen sulfide or a mercaptan.

3,637,810

ARYL N-SUBSTITUTED N-(1-CHLORO-1-ALKENYL) CARBAMATES

Henri Ulrich, Northford, and Benjamin W. Tucker, Bethany, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Oct. 22, 1968, Ser. No. 769,719

Int. Cl. C07c *125/06*

U.S. Cl. 260—479 C 9 Claims

Novel aryl N-substituted N-(1-chloro-1-alkenyl)carbamates are disclosed. These compounds are prepared by the condensation of substituted or unsubstituted phenols with N-substituted-N-(1-chloro-1-alkenyl)carbamoyl chlorides in the presence of a tertiary amine and an inert organic solvent. The aryl N-substituted-N-(1-chloro-1-alkenyl)-carbamates so obtained are useful (1) as insecticides against a variety of insects typical of which are the Mexican bean bettle, the housefly, the housecricket, the boll weevil, and the confused flour bettle and (2) as chemical intermediates for the preparation of known insecticides and of thermoplastic polymers.

3,637,811

PRODUCTION OF ORGANIC ISOCYANATES

Karl-Friedrich Zenner and Günter Oertel, Cologne-Flittard, and Hans Holtschmidt, Leverkusen-Steinbuechel, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 21, 1967, Ser. No. 684,638
Claims priority, application Germany, Nov. 30, 1966, F 50,801
Int. Cl. C07c *125/06*
U.S. Cl. 260—482 C 5 Claims

N-hydrocarbyl - N - isocyanatomethyl-carbamic acid esters and their preparation by reaction of N-hydrocarbyl-N-halomethylcarbamic acid esters with metal cyanates.

3,637,812

ACYLATION OF REACTIVE ORGANIC ACID ESTERS

Roger J. Tull, Metuchen, Edward W. Tristram, Cranford, and Avery Rosegay, Union, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Oct. 2, 1967, Ser. No. 671,937
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 P 9 Claims

Salts of di-loweralkyl hydroxymethylenemalonates are prepared by acylation of diloweralkyl malonate with loweralkyl formate. The reaction is carried out in the presence of a strong base and under reaction conditions where the loss of alkyl formate reactant is either compensated for or minimized.

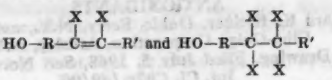
3,637,813

UNSATURATED ESTER OF HALOGENATED ALKENES

Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,336
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 H 15 Claims

This invention deals with new unsaturated esters of α,β-unsaturated carboxylic acids derived from halogenated alcohols of the formulas



wherein R is a divalent hydrocarbon moiety having at least one and no more than 10 carbon atoms, X is a member selected from the class of bromine and chlorine, and R′ is a member selected from the class of hydrogen, X and a monovalent hydrocarbon containing at least one and no more than 20 carbon atoms. Typical esters are the acrylates, methacrylates, maleates, fumarates, itaconates and cinnamates. These monomers possess fire-retardant properties and are useful for the synthesis of polymers and copolymers.

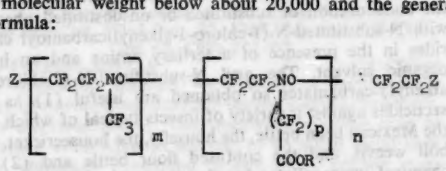
3,637,814

LIQUID NITROSO RUBBER PREPOLYMERS

Nathan Mayes, Ironia, and Ronald Michaels, Boonton, N.J., assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Mar. 27, 1968, Ser. No. 716,360
Int. Cl. C07c *81/081, 3/24*
U.S. Cl. 260—487 9 Claims

Liquid nitroso rubber prepolymers are disclosed having a molecular weight below about 20,000 and the general formula:



wherein R is selected from hydrogen and alkyl groups of 1 to 6 carbon atoms, Z is selected from chlorine, bromine, iodine and —NO_2, p is 2 to 6 and the ratio $m:n$ is from 1:1 to 50:1. The liquid prepolymers may be prepared by copolymerizing perfluoronitrosomethane, tetrafluoroethylene and a nitrosoperfluoro acid or ester in the presence of a terminator which may be chlorine, bromine, iodine or nitrogen dioxide. The polymers can be cured with such curing agents as epoxides, metal oxides and chromium perfluoroacetate to produce rubbers having good physical properties and chemical resistance.

3,637,815

MICROBICIDES: BIS(ALKANOYLOXYMETHYL) SULFIDES AND SULFOXIDES

Charles H. Tieman, Modesto, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed May 23, 1968, Ser. No. 731,645
Int. Cl. C07c *69/16, 69/28, 147/02*
U.S. Cl. 260—488 J 6 Claims

Bis(alkanoyloxymethyl) sulfides and sulfoxides, useful as microbicides.

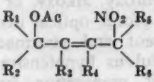
3,637,816

ACETATE DERIVATIVES OF 4-NITRO-1-HYDROXY OLEFINS AND PROCESS FOR THE PREPARATION THEREOF

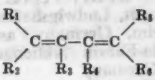
Masao L. Honjoh and Stylianos Sifniades, Parsippany, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Sept. 11, 1969, Ser. No. 857,195
Int. Cl. C07c *67/04, 69/14*
U.S. Cl. 260—488 H 6 Claims

Compounds of the structure:

(I) 

wherein R_1, R_2, R_3, R_4, R_5, and R_6 are independently hydrogen, a C_1 to C_6 alkyl radical, or a monocyclic or C_1 to C_4 alkyl-substituted aromatic moiety are readily prepared by reaction of acetyl nitrate with conjugated dienes of the structure:

(II) 

Compounds of structure (I) can be readily transformed into the corresponding aminoalkanol derivative.

3,637,817

PRODUCTION OF ETHERS AND ESTERS OF 4-HYDROXYTIGLALDEHYDE

Horst Pommer, Ludwigshafen (Rhine), Herbert Mueller, Frankenthal, Dietrich Mangold, Neckargemund, and Christof Palm, Mannheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Oct. 18, 1968, Ser. No. 768,927
Claims priority, application Germany, Oct. 21, 1967, P 16 43 681.0
Int. Cl. C07c *45/00, 67/00*
U.S. Cl. 260—491 10 Claims

The production of ethers and esters of 4-hydroxytiglaldehyde by oxidation of ethers or estesr of 3-methyl-but-2-en-1-ol with oxygen or gas containing oxygen in liquid phase at temperatures of 20° to 200° C. in the presence of catalytic amounts of heavy metal salts and bromine or

bromine compounds. The products of the process are important compounds for organic syntheses, particularly for the production of carotenoids.

3,637,818

PROCESS FOR PREPARING MIXTURES OF ACETALDEHYDE, ACETIC ACID AND VINYL ACETATE

Hans Krekeler, Wiesbaden, Hans Fernholz, Bad Soden, Taunus, and Günter Jacobsen, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 460,817, June 2, 1965. This application Apr. 16, 1968, Ser. No. 721,632

Claims priority, application Germany, June 5, 1964, F 43,089

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 A 3 Claims

Preparation of mixtures of acetaldehyde, acetic acid and vinyl acetate by reacting ethylene with molecular oxygen at 20 to 200° C. and 5 to 150 atmospheres in the liquid phase in the absence of mineral acids and anions other than acetate ions and in the presence of a Group VIII noble metal, manganese and/or cobalt acetate, and water.

3,637,819

PROCESS FOR THE MANUFACTURE OF UNSATURATED ESTERS OF CARBOXYLIC ACIDS

Kurt Sennewald and Wilhelm Vogt, Knapsack, near Cologne, Heinz Erpenbach, Surth, near Cologne, Hermann Glaser, Knapsack, near Cologne, and Helmut Dyrschka, Kottingen, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

No Drawing. Filed Dec. 5, 1968, Ser. No. 781,626

Claims priority, application Germany, Dec. 30, 1967, P 16 68 352.6

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 A 10 Claims

Production of unsaturated esters of carboxylic acids by reaction of an olefinic compound and an aliphatic or aromatic carboxylic acid, which each contain from 2 to 20 carbon atoms, with molecular oxygen, or air, in the gas phase, at elevated temperature and in contact with a carrier catalyst, the reaction being carried out in contact with a carrier catalyst containing palladium acetate, alkali metal acetate and one or more vanadium compounds as its active constituents, the dry, powdery carrier catalyst being irradiated with ultraviolet and/or visible light, prior to using it.

3,637,820

REDUCTION OF AROMATIC NITRO COMPOUNDS TO AROMATIC PRIMARY AMINES

David Dodman and John Mathers Woolley, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Nov. 14, 1968, Ser. No. 775,894

Claims priority, application Great Britain, Nov. 24, 1967, 53,636/67

Int. Cl. C07c *85/10, 143/56, 143/58*

U.S. Cl. 260—508 13 Claims

A process for the manufacture of an aromatic primary amine by reacting in the presence of a catalyst an aromatic nitro compound and a reducing agent selected from the class consisting of:

(a) hydrogen and

(b) carbon monoxide and water or aliphatic alcohol,

at a temperature in the range of 100° to 200° C., the improvement which comprises utilizing as the catalyst, one consisting essentially of two or three heavy metals selected from the group consisting of manganese, iron, cobalt, nickel, copper, silver and cerium as their oxides, hydroxides or carbonates, the catalyst being prepared by either co-precipitation from solution or a heating together of the said heavy metals as their hydroxides or heat-unstable salts or mixtures thereof.

3,637,821

PROCESS FOR THE PRODUCTION OF SUBSTITUTED ACETIC ACIDS

Kaspar Bott, Marl, Germany, assignor to Chemische Werke Huls A.G., Marl, Germany

No Drawing. Filed Aug. 11, 1966, Ser. No. 571,714

Claims priority, application Germany, Aug. 21, 1965, P 15 18 668.2

Int. Cl. G07c *61/12*

U.S. Cl. 260—514 B 12 Claims

To produce substituted acetic acids vinylidene chloride is reacted in 80–90% sulfuric acid at —5 to +20° C. with a carbonium ion-forming compound, e.g. a tertiary alcohol, a secondary alcohol, sulfates, halogenides and esters of such alcohols. The reaction can also be conducted in the presence of a Friedel-krafts catalyst, such as boron trifluoride. The process facilitates production of complex acids, such as 3-methyl and 3,5-dimethyl adamantanylacetic acids.

3,637,822

PROCESS FOR PREPARING IMPROVED FURFURAL EXTRACTS

Calvin F. Rueping and Robert T. Daniel, Beaumont, Tex., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Nov. 21, 1968, Ser. No. 777,905

Int. Cl. C07c *61/00*

U.S. Cl. 260—514 N 8 Claims

A process for preparing neutralized and dehydrated furfural extracts having improved heat transfer properties.

3,637,823

PREPARATION OF CARONIC ACID FROM DELTA-3-CARENE

Lloyd Berg and James H. Jarrett, Bozeman, Mont., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Oct. 20, 1969, Ser. No. 867,942

Int. Cl. C07c *51/32*

U.S. Cl. 260—514 P 3 Claims

Pure-cis-caronic acid is obtained by oxidizing delta-3-carene with a permanganate in acetone, separating the manganese dioxide and absorbed oxidation products formed in the oxidation reaction from the acetone, slurrying the manganese dioxide and oxidation products in an aqueous medium, removing the manganese dioxide from the aqueous solution by filtration, extracting oxidation products at a pH of 3 from the aqueous solution with ether, extracting cis-caronic acid from the remaining aqueous solution at a pH of 1 and drying the extract solution, and evaporating the ether to form crystals of pure cis-caronic acid.

3,637,824

3-(N-METHYL)-LOWERALKANOYLAMIDO-5-AMINO-2,4,6-TRIIODOBENZOIC ACIDS

Hugo Holtermann, Baerum, Leif Gunnar Haugen, Oslo, and Knut Wille, Baerum, Norway, assignors to Nyegaard & Co. A/S, Oslo, Norway

No Drawing. Original application Dec. 8, 1960, Ser. No. 74,485, now Patent No. 3,476,802, dated Nov. 4, 1969. Divided and this application July 18, 1969, Ser. No. 843,179

Claims priority, application Norway, Nov. 17, 1960, 138,044

Int. Cl. C07c *103/32*

U.S. Cl. 260—518 A 2 Claims

There are provided 3-(N-methyl)-loweralkanoylamido-5-amino-2,4,6-triiodobenzoic acids, particularly the 3-(N-methyl)-acetamido-compound. These compounds are valuable intermediates for the preparation of 3-(N-methyl)-loweralkanoylamido-5-lower alkanoylamido-2,4,6-triiodobenzoic acids which are useful as X-ray contrast agents.

3,637,825

3-(CARBOXYALKANOYLAMINO)-2,4,6-TRIIODOHYDROCINNAMIC ACIDS

James H. Ackerman, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 715,584, Mar. 25, 1968. This application Aug. 29, 1969, Ser. No. 854,291

Int. Cl. C07c *103/32*

U.S. Cl. 260—518 A 6 Claims

3-amino-2,4,6-triiodohydrocinnamic acid and α-alkyl or α-phenyl derivatives thereof react with dibasic acid anhydrides to give the corresponding 3-cyclic imides (A), which can be hydrolyzed to the corresponding anilic acids (B). The latter can be further alkylated on the nitrogen atom. Compounds A and B are useful as cholecystographic agents.

3,637,826

TETRACYCLINE DERIVATIVE

Gianfranco Intelisano, Sesto San Giovanni, Italy, assignor to Italchemi s.r.l. Istituto Chimico Farmaceutico, Milan, Italy

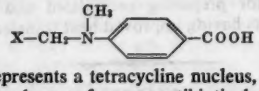
No Drawing. Filed July 5, 1968, Ser. No. 742,528

Claims priority, application France, July 10, 1967, 113,714

Int. Cl. C07c *103/30*

U.S. Cl. 260—519 1 Claim

New antibiotic tetracycline derivatives of formula



(I)

wherein X represents a tetracycline nucleus, derived from the tetracycline base or from an antibiotic derivative thereof, attached by its amino nitrogen atom.

Said derivatives are prepared by reacting tetracycline base or a derivative thereof with p-methylaminobenzoic acid and formaldehyde.

3,637,827

BENZHYDRYLOXY-CYCLOPROPANECARBOXYLIC ACIDS AND AMIDES

Carl Kaiser, Haddon Heights, N.J., and Charles L. Zirkle, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Jan. 6, 1966, Ser. No. 519,012, now Patent No. 3,462,491, dated Aug. 19, 1969. Divided and this application Apr. 22, 1969, Ser. No. 818,384

Int. Cl. C07c *63/00, 103/30*

U.S. Cl. 260—520 5 Claims

Benzhydryloxy-cyclopropanecarboxylic acids and amides wherein the benzhydryl moiety may be halogen, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl or trifluoromethyl substituted and the amides are N-mono- or N,N-disubstituted by lower alkyl or include a cyclic amido moiety, are useful as intermediates for the preparation of corresponding aminocyclopropane derivatives. The latter have mild tranquilizing and antidepressant activity.

3,637,828

2-HYDROXY - 3,5,6 - TRICHLOROMANDELIC ACID AND A PROCESS FOR THE MAKING THEREOF

Ulrich Holtschmidt and Eberhard Hofmann, Essen, Germany, assignors to Th. Goldschmidt A.G., Essen, Germany

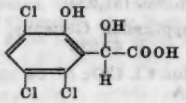
No Drawing. Filed Apr. 21, 1969, Ser. No. 818,097

Claims priority, application Switzerland, May 6, 1968, 6,726/68

Int. Cl. C07c *65/02*

U.S. Cl. 260—521 A 7 Claims

α-(2-hydroxy-, 3,5,6-trichloro-) phenylglycol-acid of the structural formula



The new acid has pronounced biocidal activity.

3,637,829

LIQUID PHASE OXIDATION OF MONONUCLEAR AROMATIC COMPOUNDS

Ralph O. Kerr, Houston, Tex., asisgnor to Petro-Tex Chemical Corporation, Houston, Tex.

No Drawing. Filed May 8, 1968, Ser. No. 727,668

Int. Cl. C07c *63/02*

U.S. Cl. 260—524 R 17 Claims

A process for the oxidation of mononuclear aromatic compounds having at least one oxidizable group selected from methyl, hydroxymethyl, and aldehyde, in the presence of oxygen, cobaltous or cobaltic ions and selenium at an elevated temperature, and at atmospheric pressure or greater.

3,637,830

CATALYTIC PROCESS OF NO OXIDATION OF DIALKYLNAPHTHALENES

William D. Vanderwerff, West Chester, Pa., and Henry J. Peterson, Wilmington, Del., assignors to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,803

Int. Cl. C07c *47/52, 63/02*

U.S. Cl. 260—524 R 32 Claims

Useful partial oxidation products of dialkylnaphthalenes, such as the naphthalenedicarboxaldehyde and the naphthalenedicarboxylic acid are prepared by using molecular oxygen and a catalytic amount of nitric oxide or nitrogen dioxide, that is, substantially less than the stoichiometric amount of nitrogen dioxide necessary to oxidize the dialkylnaphthalenes. The catalyst is a combination of 0.01 moles to 0.6 mole of the nitrogen oxide per mole of dialkylnaphthalene and 0.1 to 6 weight percent of selenium. The oxidations are carried at superatmospheric pressures in a closed system at temperatures of about 160–275° C. Oxygen is added in at least the stoichiometric amount needed for the oxidations. In the temperature range of about 160–225° C. the dialdehyde is the predominant product; at about 225 to 275° C. the diacid predominates.

3,637,831

CATALYTIC TREATMENT OF VAPORIZED ACIDS

Albert L. Remsberg, Silsbee, Tex., assignor to Mobil Oil Corporation

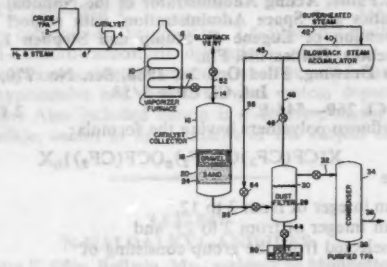
Filed Sept. 25, 1967, Ser. No. 671,535

Int. Cl. C07c *51/42*

U.S. Cl. 260—525 22 Claims

Continuous purification of aromatic polycarboxylic acids (e.g., crude terephthalic acid) by treatment of the

vaporized acid in the presence of a suspended finely divided solid hydrogenation catalyst (e.g., palladium-on-carbon) and hydrogen at elevated temperatures wherein more effective utilization of the catalyst is obtained by filtering most of the suspended catalyst out of the vapor stream onto one or more catalyst retention beds of particles of inert refractory material (e.g., sand and gravel) and thereafter condensing the purified acid vapor to the



solid state in the substantial absence of extraneous solids; much of the very fine ash which is also usually present is similarly retained by the beds with a substantial reduction in the load on the usual final surface or membrane filters and the small amount of catalyst particles passing through the retention beds serves as a filtering assistant that facilitates clearing the surface filters of the cementitious layer of finer ash particles.

3,637,832

PREPARATION OF STRAIGHT CHAIN DICARBOXYLIC ACIDS

Jesse Oris White, Orange, and Darwin Darrell Davis, Victoria, Tex., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 12, 1968, Ser. No. 712,542
Int. Cl. C07c *51/28, 55/02, 55/20*
U.S. Cl. 260—531 R **5 Claims**

A C_8–C_{12} dicarboxylic acid which can be readily refined to high purity is produced by conducting an oxidation of an alcohol and a ketone with all of the reactants in the liquid phase and after substantially all of the alcohol and ketone have been oxidized maintaining the oxidate in the liquid phase under oxidizing conditions at a temperature in the range 90 to 110° C. for a time in the range 3 to 60 minutes.

3,637,833

PREPARATION OF CARBOXYLIC ACIDS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Dec. 21, 1967, Ser. No. 692,262
Int. Cl. C07c *53/22*
U.S. Cl. 260—533 A **10 Claims**

A process for preparation of carboxylic acids comprising reacting an olefin, carbon monoxide and water in the presence of hydrogen and a catalyst comprising rhodium.

3,637,834

OXIDATION OF OLEFINES TO UNSATURATED ALDEHYDES AND UNSATURATED ACIDS

Gianfranco Pregaglia, Milan, Marco Agamennone, Novara, Nicola Santangelo, Milan, and Mauro Croci, Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed May 14, 1968, Ser. No. 728,915
Claims priority, application Italy, May 16, 1967, 16,134/67, Patent 796,268
Int. Cl. C07c *57/04*
U.S. Cl. 260—533 N **7 Claims**

Propylene and isobutene are oxidized in the vapor phase to unsaturated aldehydes and unsaturated acids, with the aid of a catalyst essentially constituted by tellurium and a monophase system based on molybdenum anhydride the crystalline lattice of which is altered due to the random substitution of some of the molybdenum atoms by atoms of a metal Ms selected from the group consisting of Ni, Mn and Co, and in which the atomic ratio Ms/Mo is 1:9.

3,637,835

METHOD OF OXIDIZING OLEFINS

Joseph W. Nemec, Rydal, Pa., and Francis W. Schlaefer, Pennsauken, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of applications Ser. No. 555,247, June 6, 1966, and Ser. No. 615,880, Feb. 6, 1967. This application Dec. 13, 1968, Ser. No. 783,641
Int. Cl. C07c *57/04, 47/22*
U.S. Cl. 260—533 N **4 Claims**

A catalyst, a method for its preparation, a method of preparing catalytic cobalt molybdate, and a process for the oxidation of olefins to the corresponding unsaturated aldehydes and unsaturated carboxylic acids are provided. A mixture comprising the olefin and oxygen is contacted in the vapor phase at a temperature within the range of from about 300° C. to about 500° C. in the presence of water and solid catalyst particles, each particle comprising a fluxed mixture of (a) calcined cobalt molybdate particles, (b) a telluride of arsenic, bismuth or antimony and (c) a molybdenum compound, such as molybdenum trioxide, which is volatile to an extent that slow migration within the pellet occurs at elevated temperatures. The volatile molybdenum compound, non-catalytic in itself, surprisingly gives a much longer productive life to the catalyst, the catalyst, in spite of the diluent, is more productive per unit of time, and the added physically soft compound does not make the particles fragile. In use, the tellurium content diminishes, and the composition of the catalyst changes slowly in other ways.

3,637,836

CHLORO-PHOSPHNE-m-CARBORANE AND A METHOD OF MAKING THEM

Roy P. Alexander, Killingworth, and Hansjuergen A. Schroeder, Hamden, Conn., assignors to Olin Mathieson Chemical Corporation

No Drawing. Original application Feb. 25, 1966, Ser. No. 529,944, now Patent No. 3,444,272, dated May 13, 1969. Divided and this application July 31, 1968, Ser. No. 761,381
Int. Cl. C07f *9/52*
U.S. Cl. 260—543 P **10 Claims**

Chlorophosphine-m-carboranes are prepared by reacting di(alkali-metal)-m-carboranes with chlorophosphines. These compounds are useful as flame retardants in plastics and coated paper.

3,637,837

γ-ALKYLTHIOLYSINES

Yasuo Fujimoto and Shinsuke Koshimoto, Machida-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1968, Ser. No. 768,134
Int. Cl. C07c *149/20, 149/24*
U.S. Cl. 260—534 S **14 Claims**

γ-Alkylthiolysines and a process for producing them which comprises reacting γ-chlorolysine or an acid salt thereof with an alkylmercaptan, or an alkali metal or alkaline earth metal salt thereof. The reaction is preferably conducted in an inert solvent with heating. The resultant lysine derivatives are useful as anti-oxidants, as topical agents for the treatment of wounds and burns and as anti-tumor agents.

3,637,838
PROCESS FOR THE PREPARATION OF D,L-LYSINE
Marvin T. Tetenbaum and Edward R. Degginger, Convent, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Apr. 2, 1969, Ser. No. 812,864
Int. Cl. C07c *99/00, 101/24*
U.S. Cl. 260—534 L **1 Claim**

Trans-diethyl-4-chloro-2-butenyl-acetamidomalonate, a new composition of matter, readily undergoes ammination in liquid ammonia to form diethyl-4-amino-2-butenyl-acetamidomalonate which can be transformed by known methods into lysine, a valuable dietary supplement. The trans-diethyl-4-chloro - 2 - butenyl-acetamidomalonate is formed by reaction of trans 1,4-dichloro-butene-2 with the alkali metal salt of diethyl acetamidomalonate.

3,637,839
PROCESS FOR THE PREPARATION OF ε-AMINOCAPROIC ACID, ε-AMINOCAPROAMIDE, OR MIXTURES THEREOF
Ikuzo Tanaka, Hideo Uehara, and Masayuki Yamagata, Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan
No Drawing. Filed June 23, 1969, Ser. No. 835,796
Claims priority, application Japan, June 25, 1968, 43/44,106; June 29, 1968, 43/45,463; Oct. 7, 1968, 43/73,016; Oct. 16, 1968, 43/75,422
Int. Cl. C07c *99/00, 103/02*
U.S. Cl. 260—534 R **13 Claims**

Process for the preparation of ε-aminocaproic acid, ε-aminocaproamide, or mixtures thereof in high yield which can be converted into ε-caprolactam, by contacting 2-nitrocyclohexanone, 2 - nitrocyclohexen - 1 - ol or mixtures thereof with hydrogen in an aqueous medium of pH 4.5–13 at a temperature ranging from 5 to 220° C. in the presence of an active hydrogenation catalyst, preferably in the presence of an ammonium ion, such as ammonia and ammonium salts of organic or inorganic acids.

3,637,840
PROCESS FOR PRODUCING BIS-(DIMETHYLAMINO)-PHOSPHORYL FLUORIDE
Gerhard Kunstle, Hellmuth Spes, and Alfred Trommet, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany
No Drawing. Filed Apr. 3, 1969, Ser. No. 813,331
Claims priority, application Germany, Apr. 24, 1968, P 17 68 278.9
Int. Cl. C07f *9/34*
U.S. Cl. 260—543 F **3 Claims**

Process for producing bis-(dimethylamino)-phosphoryl fluoride by reacting bis-(dimethylamino)-phosphoryl chloride with an aqueous alkali fluoride solution or an ammonium fluoride solution, the reaction being performed at a temperature of 60–110° C. in a reaction-inert water-insoluble solvent for bis-(dimethylamino)-phosphoryl chloride, and the reaction mixture containing 30 to 75% water referred to the water-free alkali or ammonium fluoride and a phosphate buffer solution of primary and secondary phosphates and dimethylamine hydrochloride.

3,637,841
PROCESS FOR CARBOXYLIC ACID HALIDE MANUFACTURE
Brian Martin, Erie, Pa., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Nov. 29, 1967, Ser. No. 686,710
Int. Cl. C07c *51/58*
U.S. Cl. 260—544 M **13 Claims**

Carboxylic acid halides are made by a new process comprising contacting the vapors of the corresponding carboxylic acid and a hydrogen halide at a temperature between 100° and 600° C., adding the vapor of an inert, water-insoluble solvent, condensing the resulting vaporous mixture and removing the desired acid halide from the solvent phase. While not necessary to the invention, a wide range of catalysts may be used to improve yields.

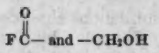
3,637,842
PERFLUORO POLYETHER ACYL FLUORIDES
T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of Eugene C. Stump and Stephen Eugene Rochow, Gainesville, Fla.
No Drawing. Filed Oct. 24, 1968, Ser. No. 770,425
Int. Cl. C07c *5/58*
U.S. Cl. 260—544 F **2 Claims**

Perfluoro polyethers having the formula:

$$X[CF(CF_3)O(CF_2)_pOCF(CF_3)]_nX$$

where

n is an integer of from 2 to 12,
p is an integer of from 2 to 23, and
X is selected from the group consisting of

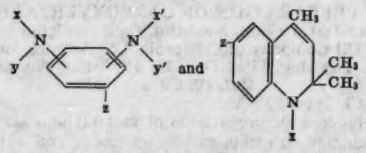


3,637,843
SYNTHESIS OF DICYANOFORMAMIDES HAVING AN AROMATIC ORGANIC MOIETY
Tad L. Patton, Baytown, Tex., assignor to Esso Research and Engineering Company
No Drawing. Filed Nov. 24, 1967, Ser. No. 685,288
Int. Cl. C07c *125/08*
U.S. Cl. 260—545 R **4 Claims**

Dicyanoformamides having aromatic moieties as novel composition of matter are prepared by the reaction of a diisocyanate having an aromatic moiety with two (2) moles of hydrogen cyanide in the presence of a catalyst which will not promote further polymerization.

3,637,844
THIOPHENYLENEDIAMINES
Chester D. Trivette, Jr., St. Albans, W. Va., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Original application Jan. 10, 1966, Ser. No. 519,408, now Patent No. 3,382,219, dated May 7, 1968. Divided and this application Sept. 20, 1967, Ser. No. 679,952
Int. Cl. C07c *145/00*
U.S. Cl. 260—551 S **7 Claims**

Thioamines of the formulas



wherein each compound is the N-thio derivative of phenylene diamine or 2,2,4 - trimethyl - 1,2 - dihydroquinoline which are useful as premature vulcanization inhibitors and antidegradants for diene rubber.

3,637,845
FLUOROALKANESULFONAMIDES
George G. I. Moore, White Bear Lake, and Alvin C. Conway, North St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Apr. 14, 1969, Ser. No. 816,041
Int. Cl. C07c *143/74*
U.S. Cl. 260—556 F **6 Claims**

This invention relates to certain N-acylfluoroalkanesulfonamides which are active anticonvulsants. Processes for the preparation of the compounds are described.

3,637,846

CARBOSTYRIL DERIVATIVES

Janis Plostnieks, Philadelphia, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Original application Mar. 30, 1967, Ser. No. 626,982. Divided and this application Mar. 27, 1970, Ser. No. 24,472

Int. Cl. C07c *103/30*

U.S. Cl. 260—558 P 1 Claim

The compounds herein are 3,4-dihydro-4-methyl-4-phenyl-6-chloro-carbostyril derivatives, useful for their various pharmacological activities, such as anti-inflammatory, hypotensive and central nervous system depressant activities. Also included herein is 4′-chloro-β-methyl-cinnamanilide, useful in the synthesis of the subject carbostyrils.

3,637,847

N-HALOALKYL-ANILIDES

John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 705,031, Feb. 13, 1968, which is a continuation-in-part of application Ser. No. 535,664, Mar. 21, 1966, which in turn is a continuation-in-part of application Ser. No. 329,279, Dec. 9, 1963. This application Sept. 3, 1969, Ser. No. 855,030

The portion of the term of the patent subsequent to May 6, 1986, has been disclaimed

Int. Cl. C07c *103/33*

U.S. Cl. 260—562 B 18 Claims

N-haloalkylanilides and their preparation by the reaction of acyl halides with aromatic azoalkine.

These compounds possess herbicidal activity and are valuable intermediates for the preparation of compounds having herbicidal activity.

3,637,848

CERTAIN DIFLUORAMINO COMPOUNDS

Kurt Baum, Los Angeles, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Sept. 6, 1962, Ser. No. 223,576

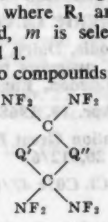
Int. Cl. C07c *85/00*

U.S. Cl. 260—563 R 33 Claims

1. Gem-difluoramino compounds of the formula:

wherein A is an alkylene radical having at least 2 carbon atoms; R_1 and R_2 are selected from the group consisting of hydrogen, alkyl, haloalkyl, and alkylene radicals which join together to complete a carbocyclic compound containing from 5 to about 8 carbon atoms in the ring; and *m* is selected from zero and an integer of from 1 to about 4 except in the case where R_1 and R_2 join to form a carbocyclic compound, *m* is selected from the group consisting of zero and 1.

5. Gem-difluoramino compounds of the formula:



wherein Q′ is an alkylene radical containing from 1 to about 3 carbon atoms and Q″ is an alkylene radical containing from 2 to about 3 carbon atoms.

3,637,849

SUBSTITUTED BENZYLIDENEAMINO GUANIDINES

William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Aug. 16, 1968, Ser. No. 765,739

The portion of the term of the patent subsequent to July 6, 1988, has been disclaimed

Int. Cl. C07c *133/10*

U.S. Cl. 260—564 F 3 Claims

Substituted benzylideneamino - 3 - hydroxy-3-lower-alkyl-guanidines, e.g., 1-(2,6-dichlorobenzylideneamino)-3-hydroxy-3-methyl guanidine, are useful as hypotensives.

3,637,850

SUBSTITUTED BENZYLIDENEAMINO GUANIDINES

William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Apr. 4, 1969, Ser. No. 813,719

The portion of the term of the patent subsequent to July 6, 1988, has been disclaimed

Int. Cl. C07c *133/10*

U.S. Cl. 260—564 F 2 Claims

Substituted benzylideneamino - 3 - hydroxy guanidines, e.g., 1-(m-trifluoromethylbenzylideneamino)-3 - hydroxy-guanidine hydrochloride, are useful as hypoglycemics-antihyperglycemics.

3,637,851

N - CYCLOALKYL-CHLOROBENZYLIDENIMINES AND HERBICIDAL COMPOSITIONS CONTAINING SAME

Edmund J. Rumanowski, Dover, N.J., assignor to Tenneco Chemicals, Inc.

No Drawing. Filed Oct. 18, 1967, Ser. No. 676,052

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 F 8 Claims

N-cycloalkyl-chlorobenzylidenimines are effective selective herbicides. Illustrative of these herbicidal compounds are N-cyclohexyl-2,3,6-trichlorobenzylidenimine, N-cyclohexylmethyl-2,3,6-trichlorobenzylidenimine, and N-cycloheptyl-2,3,6-trichlorobenzylidenimine. These compounds are prepared by the reaction of equivalent amounts of a chlorobenzaldehyde and a cycloalkyl amine at about 60° to 100° C.

3,637,852

1-PHENOXY-2-HYDROXY-3-ISOPROPYLAMINO-PROPANES AND SALTS THEREOF

Herbert Köppe, Ingelheim, Albrecht Engelhardt, Mainz, Gerhard Ludwig, Wedel, and Karl Zeile, Ingelheim, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhine, Germany

No Drawing. Continuation-in-part of application Ser. No. 391,012, Aug. 20, 1964. This application Feb. 28, 1967, Ser. No. 619,191

Claims priority, application Germany, Aug. 26, 1963, B 73,262; Feb. 6, 1967, B 91,070

Int. Cl. C07c *93/00, 93/02*

U.S. Cl. 260—570.7 3 Claims

1-substituted phenoxy-2-hydroxy-3-N-isopropyl-amino-propanes and acid addition salts thereof, possessing bradycardia activity and N-isopropyl-nor-adrenaline antagonistic activity.

3,637,853

O,O'-BIS(γ-DIMETHYLAMINO-PROPYL)-DIISO-EUGENOL AND SALTS THEREOF

Jenö Körösi, István Pataky, and Tibor Láng, Budapest, Hungary, assignors to Egyesult Gyogyszer—es Tapszergyar, Budapest, Hungary

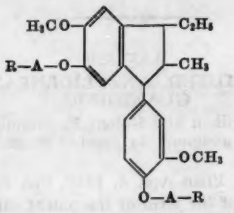
No Drawing. Filed Nov. 20, 1967, Ser. No. 684,504

Claims priority, application Hungary, Nov. 26, 1966, EE-1,312

Int. Cl. C07c *93/06*

U.S. Cl. 260—570.7 1 Claim

New compounds of hypertensive and spasmolytic activity having the formula



wherein R is a dimethylamino, diethylamino, piperidino, morpholino or N'-benzoyl-piperazino groups, and A is a straight or branched chain alkylene group having from 2 to 4 carbon atoms, and the dihydrochloric, maleic and tartaric acid salts thereof.

3,637,854

1-HALO - 5 - (3-N-HYDROXY-N-METHYL-AMINO-PROPYL OR PROPYLIDENE) - 5H-DIBENZO[a,d] CYCLOHEPTENES AND THE SALTS THEREOF

Emilio Kyburz, Reinach, and Hans Spiegelberg, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Mar. 12, 1969, Ser. No. 806,699

Claims priority, application Switzerland, Mar. 20, 1968, 4,203/68

Int. Cl. C07c *87/28*

U.S. Cl. 260—570.8 TC 15 Claims

1-halo-5-(3-N-hydroxy-N-methylaminopropyl or propylidene)-5H-dibenzo[a,d]cycloheptenes, prepared, inter alia, by the oxidation of the corresponding dehydroxy cycloheptene, are described. The end products are useful as antidepressants.

3,637,855

PREPARATION OF AMINES FROM N-SUBSTITUTED AMIDES

Harlan E. Tiefenthal, Western Springs, and Eugene J. Miller, Wheaton, Ill., assignors to Armour Industrial Chemical Company, Chicago, Ill.

No Drawing. Filed July 1, 1968, Ser. No. 741,291

Int. Cl. C07c *85/12*

U.S. Cl. 260—583 12 Claims

A process for preparation of primary and secondary amines comprising reacting an N-substituted amide with alkyl amines at an elevated temperature. The reaction may be carried in the vapor phase with the lower alkyl amines. The amines formed by this reaction are useful as mineral flotation agents, biocides, and as intermediates to form surface active chemicals such as diamines, quaternary ammonium compounds and the like.

3,637,856

TRANS-1-p-(DIALKYLAMINOALKYL) PHENYL-1,2-DIPHENYL-ALK-1-ENES AND SALTS THEREOF

Justus Kenneth Landquist and Dora Nellie Richardson, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

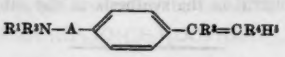
No Drawing. Filed June 22, 1966, Ser. No. 559,409

Claims priority, application Great Britain, July 12, 1965, 29,436/65

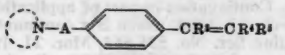
Int. Cl. C07c *87/28*

U.S. Cl. 260—570 R 11 Claims

A trans isomer of an alkene derivative selected from the group consisting of compounds of the formula:



wherein R^1 and R^2 are alkyl of 1–2 carbon atoms, A is alkylene of up to 4 carbon atoms, R^3 and R^4 are selected from the group consisting of phenyl, halophenyl, methylphenyl and methoxyphenyl, and R^5 is alkyl of 1–4 carbon atoms, and compounds of the formula:



wherein

is selected from the group consisting of N-piperidino, N-morpholino and N-pyrrolidino, and A, R^3, R^4 and R^5 have the meanings stated above, and the pharmaceutically-acceptable salts thereof said compounds exhibit oestrogenic and antioestrogenic activity.

3,637,857

METHOD OF OXIDIZING 1,2-DIARYL ETHANOLS WITH NITRIC ACID TO CORRESPONDING KETONES

Jan Magnus Bakke and Christer Lennart Hakansson, Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

No Drawing. Continuation-in-part of abandoned application Ser. No. 747,068, July 24, 1968. This application May 4, 1970, Ser. No. 34,575

Int. Cl. C07c *49/76, 49/80, 41/82*

U.S. Cl. 260—590 3 Claims

1,2-diaryl-ethanols of the formula

$$Ar—CH_2—CHOH—Ar'$$

where Ar and Ar^1 are phenyl or substituted phenyl are converted to the corresponding ketones with nitric acid in the presence of an organic solvent which is immiscible with and resistant to oxidation by nitric acid.

3,637,858

STABILISED MONOMERIC GLYOXAL SOLUTIONS

Andrew Harper Dinwoodie, Dalry, and George Gourlay, Stevenston, Scotland, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Apr. 19, 1968, Ser. No. 722,567

Claims priority, application Great Britain, May 3, 1967, 20,612/67

Int. Cl. C07c *47/02*

U.S. Cl. 260—601 1 Claim

Stabilised monomeric glyoxal solutions comprise anhydrous monomeric glyoxal, a free-radical inhibitor and an anhydrous organic solvent.

3,637,859

FRAGRANCE MATERIALS AND PROCESSES

Jack H. Blumenthal, Oakhurst, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,465
Int. Cl. C07c *47/20*
U.S. Cl. 260—601 1 Claim

The novel aldehyde 3,7-dimethyl-3-ethyl-6-octenal, perfume and fragrance compositions containing such aldehyde, and processes for producing same.

3,637,860

PROCESS OF PREPARING GLYOXAL

William P. Keaveney, Pompton Plains, and James J. Pappas, Parsippany, N.J., assignors to Inmont Corporation, New York, N.Y.

No Drawing. Filed May 22, 1968, Ser. No. 731,308
Int. Cl. C07c *45/04*
U.S. Cl. 260—604 R 11 Claims

A process of preparing glyoxal by reductive ozonolysis of benzene in a participating solvent.

3,637,861

METHOD FOR PRODUCING NOVEL STABILIZERS FOR AQUEOUS FORMALDEHYDE SOLUTIONS AND PRODUCT

Frederic J. Shelton, Tacoma, Wash., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,706
Int. Cl. C07c *47/04*
U.S. Cl. 260—606 5 Claims

Novel stabilizers for concentrated aqueous formaldehyde solutions are produced by reacting an organic halogenated silane and a long chain carbohydrate in pyridine. These stabilizers are effective over the temperature range from about 20° C. to about 90° C. The stabilizers of this invention do not exhibit any appreciable foaming and prevent polymer formation at room temperature.

3,637,862

ANETHOLE MERCAPTAN

Paul F. Warner, Phillips, Tex., and James W. Stanley, Jr., Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Feb. 9, 1967, Ser. No. 614,815
Int. Cl. C07c *149/00;* C09g *1/00*
U.S. Cl. 260—609 D 1 Claim

Anethole mercaptan, which has a mild odor and is suitable as a copper polish, is made by reacting anethole and hydrogen sulfide.

A process for producing anethole mercaptan by contacting anethole with hydrogen sulfide in the presence of ultraviolet light. The mol ratio of the hydrogen sulfide to anethole is 100:1 to 1:1 and the rate of reaction can be increased by using triphenyl phosphite and/or acetone as a promoter. The product recovered is anethole mercaptan.

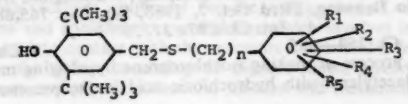
3,637,863

3,5-DI-t-BUTYL-4-HYDROXYBENZYL PHENYL SULFIDES

Harry Braus, Springdale, and Jay R. Woltermann, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 22, 1967, Ser. No. 684,918
Int. Cl. C07c *149/36*
U.S. Cl. 260—609 F 3 Claims

Compound having the formula



n is a positive integer ranging from 0 to 22; and R_1, R_2, R_3, R_4 and R_5 is each H or an alkyl radical having 1 to 22 carbon atoms which may be straight chain or branched. These compounds are useful for stabilizing organic materials.

3,637,864

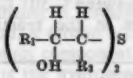
BIS-(HYDROXYALKYL)-SULFIDES AND PREPARATION THEREOF

Wilfried Umbach, Langenfeld, Rhineland, Rainer Mehren, Neuss, Rhineland, and Werner Stein, Erkrath-Unterbach, Germany, assignors to Henkel & Cie, G.m.b.H., Dusseldorf, Germany

No Drawing. Filed Apr. 22, 1969, Ser. No. 818,441
Claims priority, application Germany, Apr. 23, 1968, P 17 68 266.5
Int. Cl. C07c *149/18*
U.S. Cl. 260—609 A 5 Claims

A process for the preparation of bis-(hydroxyalkyl)-sulfides which comprises the steps of reacting an epoxide selected from the group consisting of mono-vicinal-epoxy-epoxide compounds and poly-vicinal-epoxy epoxide compounds with substantially the stoichiometric amount of hydrogen sulfide, in the absence of solvents at a temperature of between about 40° C. and 200° C. and normal pressures in the presence of from about 0.01% to 10% by weight, based on said epoxide, of a strongly basic catalyst, and recovering said bis(hydroxyalkyl)-sulfides.

Bis-(hydroxyalkyl)-sulfides of the formula



wherein R_1 is a member having from 1 to 22 carbon atoms selected from the group consisting of alkyl and alkylol, R_2 is a member selected from the group consisting of hydrogen, alkyl having from 1 to 21 carbon atoms and alkylol having from 1 to 21 carbon atoms with the proviso that the sum of the carbon atoms in R_1 and R_2 is between 6 and 22 are disclosed. The compounds are useful as antioxidants, insecticides, fungicides and intermediates.

3,637,865

POLYETHERS STABILIZED WITH MIXTURE OF BUTYLATED HYDROXY TOLUENE AND p,p'-DIOCTYL DIPHENYL AMINE

Robert C. Haring, Woodbridge, Conn., assignor to Olin Mathieson Chemical Corporation

No Drawing. Continuation-in-part of application Ser. No. 540,806, Apr. 7, 1966. This application Oct. 15, 1968, Ser. No. 767,849
Int. Cl. C07c *41/12*
U.S. Cl. 260—611.5 17 Claims

Polyether polyols stabilized against oxidation comprised of polyether polyols admixed with a stabilizing mixture of 2,6-ditertiary-butyl-4-methyl phenol and a p,p'-dialkyl diphenyl amine. Polyurethane foams can be inhibited against scorching when the same stabilizing mixture is utilized in the foam preparation.

3,637,866

SUBSTITUTED PERFLUORO DIPHENYL ETHERS

Ralph J. De Pasquale and Christ Tamborski, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the United States Air Force

No Drawing. Filed Feb. 13, 1968, Ser. No. 705,024
Int. Cl. C07c *43/02, 65/00, 69/76*
U.S. Cl. 260—612 R 7 Claims

Novel perfluorinated diphenyl ethers have at least 8 fluorine substituents and at least one selected substituent, other than fluorine, in the diphenyl ether nucleus. Preferably, the selected substituent is positioned para to the ether linkage. The selected substituents, preferably, are

H, Br, Cl, CF_3, CN, $COOC_2H_5$, COOH, C_6F_5, C_6F_5—O—C_6F_4, and C_6F_4—O—C_6HF_4. The products are useful as intermediates for the preparation of monomers for the synthesis of thermally stable polymers containing a fluorophenylether structure. A novel method for making such ethers involves the reaction of an alkali metal fluorophenolate with hexafluorobenzene or a derivative thereof at a temperature of about 100–150° C. and in a solvent selected from the group consisting of dimethylformamide and dimethylacetamide.

3,637,867
PROCESS FOR THE PRODUCTION OF ETHYLENIC COMPOUNDS

Duncan Clark and Percy Hayden, Norton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 507,685, Nov. 15, 1965. This application Mar. 7, 1968, Ser. No. 711,206
Claims priority, application Great Britain, Nov. 19, 1964, 47,173/64
Int. Cl. C07c *41/10, 43/20*
U.S. Cl. 260—614 AA **8 Claims**

A transetherification process in which a vinyl ether such as methyl vinyl ether is reacted with an alkanol containing 1 to 20 carbon atoms or a phenol containing up to 8 carbon atoms in the presence of a Group VIII noble metal, preferably palladium, compound. The temperature is maintained between −50° C. and 200° C. and the water concentration in the reaction medium is kept below 10%.

3,637,868
PROCESS FOR COUPLING IODOPERHALO COMPOUNDS

Henry R. Nychka, Dover, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

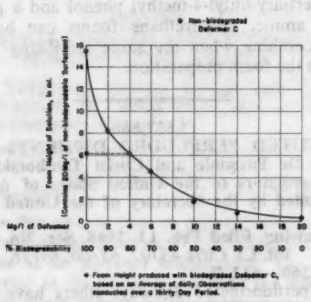
No Drawing. Filed Apr. 21, 1969, Ser. No. 818,107
Int. Cl. C07c *43/00*
U.S. Cl. 260—615 R **14 Claims**

This invention relates to a method for coupling various iodoperhalo compounds particularly iodoperfluoroalkanes and iodoperfluoroalkyl ethers, by reaction in the presence of a metal fluoride selected from the group consisting of CsF, RbF, KF and BaF_2 at a temperature of at least about 275° C.

3,637,869
NONIONIC BIODEGRADABLE FOAM CONTROL AGENT

Reinhold K. Seizinger, Trenton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed June 2, 1969, Ser. No. 829,484
Int. Cl. C07c *43/04*
U.S. Cl. 260—615 B **6 Claims**


* Non-biodegraded Dehmer C
From Height of Solution, in ml. (Common Effect of non-biodegradable Surfactant)
Mg/l of Dehmer
% Biodegradability
100 90 80 70 60 50 40 30 20 10 0
* From Height produced with biodegraded Dehmer C, based on an Average of daily Observations conducted over a Thirty Day Period.

Disclosed herein are nonionic biodegradable foam control agents prepared from the specific sequential reaction of (a) a polyfunctional initiator and an alkylene oxide having from ten to twenty carbon atoms, and (b) the product of (a) and mixtures of lower alkylene oxides, each having from two to four carbon atoms to yield a substantially hydrophobic final product having a molecular weight of from 1,000 to 2,000 which exhibits sufficient hydrophilic characteristics to be partially water-soluble.

3,637,870
PROCESS OF MANUFACTURING PARA-PHENYL-PHENOLS

Jean Berthoux, Decines, and Robert Gac, Caluire, France, assignors to Progil, Paris, France

No Drawing. Filed Jan. 22, 1969, Ser. No. 793,172
Claims priority, application France, Jan. 26, 1968, 49,573
Int. Cl. C07c *39/12*
U.S. Cl. 260—620 **5 Claims**

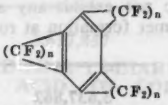
A process of manufacturing para-phenylphenols by heating a 1,1-bis (4-hydroxy-phenyl) cyclohexane to a temperature of between 200° C. to 350° C. in the presence of a platinum metal catalyst under atmospheric pressure, the reaction continuing until hydrogen release stops.

3,637,871
POLYFLUOROTRICYCLOALKENES

Joseph D. Park and Sam Kwon Choi, Boulder, Colo., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Feb. 4, 1970, Ser. No. 8,691
Int. Cl. C07c *25/18*
U.S. Cl. 260—649 F **5 Claims**

Polyfluorotricycloalkenes having the formula:



wherein *n* is 2, 3, or 4 are prepared by subjecting certain fluoroalicyclic halide compounds to high temperature in the presence of metallic copper. The compounds are useful as cryogenic lubricants in equipment intended for the preparation and use of liquid oxygen.

3,637,872
DEHYDROCHLORINATION PROCESS

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, New York, N.Y.

No Drawing. Filed June 3, 1968, Ser. No. 733,787
Int. Cl. C07c *21/04*
U.S. Cl. 260—654 D **3 Claims**

Polychlorinated hydrocarbons are dehydrochlorinated by being contacted with one or both of sodium chloride and potassium chloride in particulate form and in the presence of a trace amount of chlorine or oxygen at a temperature of 300° C. to 600° C., to provide unsautrated, chlorinated hydrocarbons.

3,637,873
PROCESS FOR PREPARING ISOCHLOROPRENE

Virgil Dean Hemphill, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,685
Int. Cl. C07c *21/20*
U.S. Cl. 260—655 **4 Claims**

A process of making isochloroprene by reacting monovinylacetylene with hydrochloric acid in the presence of

an aqueous catalyst solution being 0.1 to 4 weight percent cuprous chloride, and 3 to 32 weight percent of at least one chloride from chlorides of the Group I–A metals, Group II–A metals or ammonium chloride.

3,637,874
PREPARATION OF 1,2-DIBROMO-1,1,2-TRICHLOROETHANE
Terry C. Neubert, Kent, Ohio, assignor to The General Tire & Rubber Company
No Drawing. Filed May 3, 1968, Ser. No. 726,546
Int. Cl. C07c *17/04*
U.S. Cl. 260—658 R **3 Claims**

1,2-dibromo-1,1,2-trichloroethane is prepared by reacting bromine with trichloroethylene in the presence of a catalytic amount of a monocarboxylic acid. The product is useful as a solvent, as a lachrymator and as an intermediate in chemical reactions.

3,637,875
PROCESS FOR OBTAINING TETRACHLOROETHANES
Yves Correia and Jean-Claude Strini, Saint-Auban, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France
No Drawing. Filed Dec. 24, 1968, Ser. No. 786,736
Claims priority, application France, Dec. 29, 1967, 134,293
Int. Cl. C07c *17/04*
U.S. Cl. 260—658 R **4 Claims**

A process for the simultaneous preparation of symmetrical and unsymmetrical tetrachloroethanes by chlorination of dichloroethylenes in the liquid phase in the absence of light and catalyst.

3,637,876
METHOD OF PRODUCING ALKYLADAMANTANES
Evgeny Ignatievich Bagry, Ulitsa Nagatinskaya 38, kv. 8, and Pafnuty Ivanovich Sanin, Ulitsa Dm. Ulyanova 3, kv. 116, both of Moscow, U.S.S.R.
No Drawing. Filed Mar. 18, 1970, Ser. No. 20,805
Int. Cl. C07c *5/24*
U.S. Cl. 260—666 M **6 Claims**

The present invention relates to methods of production of alkyladamantanes.

The method according to the invention consists in isomerization of tricyclic saturated condensed hydrocarbons at a temperature of 180–320° C. in the presence of aluminium oxide or silicon oxide treated with a mineral acid or in the presence of natural or synthetic aluminium silicates.

The alkyladamantanes are used in the field of petrochemical synthesis, in production of pharmaceutical preparations and as a thermally stable hydrocarbon fuel.

3,637,877
MODIFIERS FOR SELECTIVE HYDROGENATION CATALYSTS FOR CYCLIC POLYENES
Gerhard P. Nowack and Marvin M. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed June 3, 1970, Ser. No. 43,204
Int. Cl. C07c *5/06, 5/14, 5/16*
U.S. Cl. 260—666 A **10 Claims**

A method of modifying iron, cobalt and nickel-containing catalysts employed for the hydrogenation of diolefins and triolefins to monoolefins which involves introducing into contact with the reactants a material selected from the group consisting of organic acids, aldehydes, ketones, anhydrous ammonia, amines and methanol.

3,637,878
HYDROGENATION PROCESS AND CATALYST
Rowland C. Hansford, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Continuation-in-part of application Ser. No. 754,483, Aug. 21, 1968. This application Apr. 13, 1970, Ser. No. 28,115
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 **11 Claims**

Unsaturated hydrocarbons, particularly aromatic hydrocarbons, are hydrogenated to corresponding saturated hydrocarbons, using a novel, highly active catalyst comprising platinum and/or palladium deposited by ion exchange via amminohydroxide complexes thereof (in aqueous solution) upon certain relatively non-acidic, high pore volume alumina-silica composites or cogels.

3,637,879
HYDROGENATION OF AROMATIC HYDROCARBONS
John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Application July 7, 1969, Ser. No. 839,643, which is a continuation-in-part of application Ser. No. 828,762, May 28, 1969. Divided and this application Aug. 7, 1970, Ser. No. 62,179
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 **7 Claims**

A process for hydrogenating hydrocarbons and mixtures of hydrocarbons utilizing a catalytic composite of a porous carrier material, a Group VIII noble metal component and a germanium component. A specific example of one such process is the hydrogenation of benzene to produce cyclohexane.

3,637,880
ISOMERIZATION OF PSUEDOCUMENE
George T. Burress, Beaumont, Tex., assignor to Mobil Oil Corporation
No Drawing. Filed June 4, 1970, Ser. No. 43,602
Int. Cl. C07c *5/24*
U.S. Cl. 260—668 A **7 Claims**

Pseudocumene is isomerized to mesitylene in the presence of a xylene diluent and a crystalline aluminosilicate catalyst.

3,637,881
ALKYLAROMATIC ISOMERIZATION PROCESS
Archibald H. Williams, Justice, Dalia Germanas, Des Plaines, and George R. Donaldson, Barrington, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Sept. 25, 1968, Ser. No. 762,634
Int. Cl. C07c *5/24*
U.S. Cl. 260—668 A **9 Claims**

Transalkylation of alkylaromatics, occurring during the isomerization of such alkylaromatics, is suppressed by the addition of a basic nitrogen compound to the isomerization reaction. The process is especially adaptable to the isomerization of C_3 aromatics.

3,637,882
ISOMERIZATION OF HYDRINDACENES
Ronald D. Bushick, Glen Mills, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Oct. 27, 1969, Ser. No. 869,868
Int. Cl. C07c *15/20*
U.S. Cl. 260—668 F **10 Claims**

The conversion of s-hydrindacene to as-hydrindacene, or the reverse conversion, is effected by contacting a feed rich in one of these isomers with HF—BF_3 or HF—BCl_3 to form the other isomer by isomerization. These isomers are

useful as intermediates for the preparation of benzene tetracarboxylic acids or their anhydrides, which products have known utility as monomers in polymer manufacture.

3,637,883

ALKYLATION OF AROMATIC COMPOUNDS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,353
Int. Cl. C07c 3/56
U.S. Cl. 260—671 12 Claims

Aromatic compounds, and particularly aromatic hydrocarbons, may be alkylated with olefinic hydrocarbons at relatively low operating temperatures by utilizing a catalyst comprising a mixture of zinc chloride and a higher valence halide of a metal which possesses at least two valences.

3,637,884

HF ALKYLATION OF NAPHTHALENE

Jerome A. Vesely, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 8, 1970, Ser. No. 35,946
Int. Cl. C07c 3/54
U.S. Cl. 260—671 5 Claims

In the HF alkylation of naphthalene, greater than 90% of the 2-isomer is produced by effecting the alkylation at a temperature greater than 25° C.

3,637,885

SEPARATION OF ALUMINUM ALKYLS FROM OLEFINS

Gifford G. McClaffin, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Oct. 21, 1969, Ser. No. 868,214
Int. Cl. C07c 11/02
U.S. Cl. 260—677 A 6 Claims

It is disclosed that particulate vulcanized natural or synthetic rubber is an effective means for removing metal alkyls from hydrocarbons and is particularly useful for separating aluminum triethyl from dodecene.

3,637,886

PYROLYSIS PROCESSES

Kenneth J. Frech, 480 Greenfield Circle, Tallmadge, Ohio 44273

No Drawing. Filed Sept. 22, 1967, Ser. No. 669,723
Int. Cl. C07c 3/58
U.S. Cl. 260—680 C 7 Claims

There is disclosed a method to improve the selectivity of a process whereby certain olefins which are diolefin precursors, are demethanated or de-ethanated by pyrolysis to produce certain diolefins. The improvement consists of adding to the diolefin precursors small amounts of diolefins, containing the same number of carbon atoms and side chains in the same position, if any, as the diolefin precursors, prior to the pyrolysis.

3,637,887

METHOD FOR PRODUCING ISOPRENE

Kazumi Takagi and Teruo Matsuda, Niihama-shi, Ehime-ken, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka-fu, Japan

No Drawing. Filed Jan. 30, 1970, Ser. No. 7,216
Claims priority, application Japan, Jan. 30, 1969, 44/7,107
Int. Cl. C07c 1/20, 41/12
U.S. Cl. 260—681 12 Claims

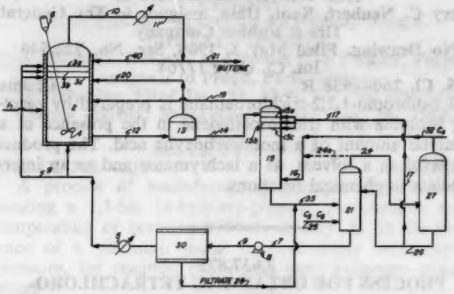
Method for producing isoprene which comprises contacting isobutene with glycol methylene ether in the gas phase in the presence of a solid catalyst. Since glycol methylene ether is highly stable under the reaction conditions, the yield of isoprene based thereon is excellent.

3,637,888

RECOVERY OF HIGH PURITY BUTADIENE BY CUPROUS SALT PARTICLES IN ALL SLURRY PROCESS

Robert P. Cahn, Millburn, N.J., and Richard J. De Feo and James H. Taylor, Jr., Baton Rouge, La., assignors to Esso Research and Engineering

Filed Feb. 26, 1970, Ser. No. 14,408
Int. Cl. C07c 7/00, 7/16, 11/16
U.S. Cl. 260—681.5 C 11 Claims



Recovery of high purity butadiene by liquid phase slurry complexing is conducted with an active cuprous halide sorbent slurried in a paraffin-containing organic diluent, coupled with slurry stripping and desorption of complexed butadiene in the presence of the diluent. The pressures and temperatures are carefully controlled during the complexing step in order to provide a high driving force so as to obtain a high rate of butadiene complexing with the cuprous halide, and to achieve a high loading of the sorbent with complexed butadiene. In addition, other novel and improved techniques for recovering the high purity butadienes are disclosed.

3,637,889

PROCESS FOR SEPARATING A TERTIARY OLEFIN

Yoshihiro Watanabe, Hyogo, and Jiro Kobayashi and Tooru Tokumaru, Osaka, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,984
Claims priority, application Japan, Mar. 12, 1969, 44/19,114
Int. Cl. C07c 1/20, 7/00, 11/08
U.S. Cl. 260—682 11 Claims

A process for separating a tertiary olefin present in C_4–C_5 cracked petroleum fractions by (1) reacting the C_4–C_5 fraction with a C_1 to C_4 primary aliphatic alcohol at 70 to 150° C. in the presence of a small amount of sulfuric acid catalyst to selectively convert a tertiary olefin, such as isobutylene, to a tertiary butyl alkyl ether, (2) separating the ether from the unreacted olefins and passing it over a metal sulfate catalyst maintained at 150 to 250° C. to recover the isobutylene and the alcohol. The alcohol may then be recycled to the first reaction.

Both reactions can be performed with high reactivity and selectivity.

3,637,890

PROCESS FOR THE PREPARATION OF OLEFINS

Brian Patrick McGrath, Chowthorne, Berkshire, and Keith Vaughan Williams, Shepperton, Middlesex, England, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed Feb. 6, 1968, Ser. No. 703,264
Claims priority, application Great Britain, Feb. 14, 1967, 6,915/67, Patent 1,159,055
Int. Cl. C07c 5/62
U.S. Cl. 260—683 D 21 Claims

Olefins are prepared by coreacting a mixture of an acyclic olefin of formula $R(R_1)C{=}CR_2(R_3)$ where the R

substituents represent hydrogen atoms, alkyl or aryl groups, and an easily polymerisable olefin e.g. isobutene, in the presence of a catalyst prepared by heating rhenium heptoxide in a stream of carrier gas whereby it is sublimed onto alumina located downstream. The catalyst thus prepared catalyses the coreaction of the olefins without polymerising the easily polymerisable olefin to any great extent.

3,637,891

PROCESS FOR THE PREPARATION OF OLEFINS

Brian Patrick McGrath, Crowthorne, Berkshire, and Christopher Patrick Cadman Bradshaw, Sunbury-on-Thames, Middlesex, England, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed Feb. 6, 1968, Ser. No. 703,265
Claims priority, application Great Britain, Feb. 13, 1967, 6,750/67, Patent 1,159,054
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D 17 Claims

Olefins are prepared by coreacting an acyclic olefin of formula $R(R_1)C{=}CR_2(R_3)$ where the R substituents represent hydrogen atoms, alkyl or aryl groups, and an easily polymerisable olefin e.g. isobutene, in the presence of a catalyst comprising molybdena supported on alumina, the catalyst also containing a minor proportion of alkali or alkaline earth metal ions. Catalysts modified in this way catalyse the coreaction of the olefins without polymerising the easily polymerisable olefin to any great extent.

3,637,892

PROCESS FOR THE PREPARATION OF OLEFINS

Brian Patrick McGrath, Crowthorne, Berkshire, and Christopher Patrick Cadman Bradshaw, Sunbury-on-Thames, Middlesex, England, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed Feb. 6, 1968, Ser. No. 703,266
Claims priority, application Great Britain, Feb. 13, 1967, 6,749/67, Patent 1,159,053
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D 17 Claims

Olefins are prepared by coreacting an acyclic olefin of formula $R(R_1)C{=}CR_2(R_3)$ where the R substituents represent hydrogen atoms, alkyl or aryl groups, and an easily polymerisable olefin e.g. isobutene, in the presence of a catalyst comprising a carbonyl of molybdenum, tungsten or rhenium supported on alumina, silica or silica-alumina, the support having been modified by the addition of alkali or alkaline earth metal ions thereto. Catalysts modified in this way catalyse the coreaction of the olefins without polymerising the easily polymerisable olefin to any great extent.

3,637,893

OLEFIN DISPROPORTIONATION

David M. Singleton, Richmond, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed July 22, 1969, Ser. No. 843,765
Int. Cl. C07c *3/62, 11/02, 13/00*
U.S. Cl. 260—683 D 8 Claims

Olefins are disproportionated with a catalyst produced by contacting (a) a molybdenum or tungsten oxide supported on an inorganic refractory oxide and (b) a perchlorohydrocarbon at elevated temperatures.

3,637,894

SYNTHESIS OF PROPYLENE FROM ETHYLENE

John C. Crano, Akron, and Elizabeth K. Fleming, Doylestown, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Aug. 22, 1969, Ser. No. 852,495
Int. Cl. C07c *3/18, 11/06*
U.S. Cl. 260—683 R 12 Claims

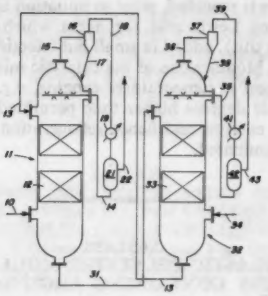
Ethylene is converted to propylene by intimately contacting the former with a mixture of a palladous halide, e.g., palladous chloride, fluoride salt of sodium, e.g., sodium fluoride, in a nitrilic reaction medium, e.g., benzonitrile.

3,637,895

DEHYDROGENATION PROCESS USING MOLTEN COPPER CHLORIDES AND OXYCHLORIDE MIXTURES

Herbert Riegel, Palisades Park, N.J., Harvey D. Schindler, New York, N.Y., Morgan C. Sze, Upper Montclair, N.J., and Maurice E. Brooks, Great Neck, N.Y., assignors to The Lummus Company, Bloomfield, N.J.

Filed Oct. 23, 1968, Ser. No. 769,811
Int. Cl. B01j *11/78*; C07c *5/20, 11/04*
U.S. Cl. 260—683.3 12 Claims



Process for dehydrogenating a feed containing either an alkane, cycloalkane, mono-halo substituted derivative thereof, or alkyl substituted aromatic hydrocarbon wherein the feed is contacted with a melt containing a multivalent metal halide in both its higher and lower valence state, such as a mixture of cupric and cuprous chloride. In accordance with a preferred embodiment, the melt is previously contacted with an oxygen containing gas to produce the corresponding oxyhalide of the metal, whereby the reaction may be effected on a continuous basis.

3,637,896

COPOLYMERISATION PROCESS

John Robert Jones, Walton-on-Thames, Surrey, and James Keith Hambling, Frimley, near Aldershot, Hampshire, England; said Jones assignor to The British Petroleum Company Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 558,588, June 20, 1966, now Patent No. 3,483,268. This application Apr. 16, 1968, Ser. No. 721,602
Claims priority, application Great Britain, May 2, 1967, 20,170/67
The portion of the term of the patent subsequent to Dec. 9, 1986, has been disclaimed
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D 6 Claims

A mixture of olefins at least one of which is an alpha olefin is copolymerised in the presence of a catalyst comprising a complex organic compound of a metal of Group VIII of the Periodic Table according to Mendeleef e.g. nickel acetyl acetonate and an activating agent at a temperature in the range −40° C. to +200° C., under such conditions of pressure that the reactants are maintained in the liquid or partially condensed phase. The activating agent may be a Grignard reagent or metal alkyl e.g. an aluminium alkyl alkoxide.

3,637,897

PROCESS FOR PRODUCING LINEAR ALPHA OLEFINS

Neville L. Cull, Baker, and Roby Bearden, Jr., and Joseph K. Mertzweiller, Baton Rouge, La., assignors to Esso Research and Engineering Company, Linden, N.J.

No Drawing. Filed Mar. 3, 1969, Ser. No. 804,006
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D 5 Claims

An improved process for catalytic polymerization, or oligomerization, of ethylene to obtain a reaction product mixture consisting essentially of C_4 to C_{200} olefins, including especially linear alpha olefins. The oligomerization reaction is conducted by adding ethylene to a diluent at pressures to maintain an ethylene concentraiton in the liquid phase sufficient to suppress copolymerization reactions involving the product olefins. It is found that higher catalyst activity and stability can be maintained if the transition metal halide and organo aluminum halide catalytic mixture is modified, prior to initiation of the reaction, with a strong Lewis acid (or agent which will generate such acid in situ), added in small but effective critical concentrations. Modification of the catalytic mixture also permits operation at temperatures ranging, e.g., about 20 to 60 centigrade degrees higher than permitted by use of an unmodified catalyst and hence refrigeration needs are reduced, or eliminated.

3,637,898

THERMOPLASTIC POLYESTER MOULDING COMPOSITIONS CONTAINING PHOSPHORUS COMPOUNDS

Walter Herwig, Frankfurt am Main, and Rudolf Uebe, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed June 24, 1970, Ser. No. 49,565
Claims priority, application Germany, July 10, 1969, P 19 34 903.2
Int. Cl. C08g *39/04*
U.S. Cl. 260—75 P 9 Claims

Thermoplastic compositions having excellent injection moulding properties are obtained from linear saturated polyesters and alkali metal salts of organic phosphonic acids, the monoesters thereof, of organic phosphonous acids or of organic phosphinic acids, the organic radicals being saturated or unsaturated alkyl, cycloalkyl, aryl, or aralykyl groups having up to 15 carbon atoms.

3,637,899

ELASTOMERIC BLOCK COPOLYMERS AND METHODS OF PRODUCING THE SAME

Nikolai Sergeevich Nametkin, Ulitsa Vavilova 37a, kv. 10; Sergei Garievich Durgarian, Ulitsa Garibaldi 21, korpus 3, kv. 67; Evgeny Vladimirovich Soloviev, B. Cherkizovskaya ulitsa 12, korpus 4, kv. 41; and Viktor Maxovich Piryatinsky, 5 Tverskaya-Yamskaya ulitsa 6, kv. 101, all of Moscow, U.S.S.R.

No Drawing. Filed Apr. 8, 1969, Ser. No. 814,464
Claims priority, application U.S.S.R., Apr. 9, 1968, 1,232,460
Int. Cl. C08f *29/12, 35/02*
U.S. Cl. 260—827 28 Claims

A method of producing elastomeric block copolymers of the type A–B–A, wherein block A is a polymer of vinyltriorganosilanes having a molecular weight of 5,000 to 200,000 and block B is a polymer of a conjugated diene having a molecular weight of 15,000–500,000, by anionic block copolymerization of vinyltriorganosilanes or a mixture of the same with styrene or a derivative of styrene, and conjugated dienes in an organic solvent in the presence of a lithium-based catalyst.

3,637,900

POLYAMIDE FIBERS WITH ALIPHATIC SULFONIC ACID CONTAINING ANTISTATIC AGENTS

Isao Kimura and Fumimaro Ogata, Osaka, and Koichiro Ohtomo, Settsu, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,212
Claims priority, application Japan, Apr. 22, 1969, 44/31,415
Int. Cl. C08g *41/04, 45/12*
U.S. Cl. 260—830 P 10 Claims

A fiber having durable anti-electrostatic and hydrophilic properties to withstand repeated launderings, which comprises a polymer composition consisting of 99.95—60% by weight of a thermoplastic synthetic linear polymer such as polyamides, polyesters, polyesterethers, polyolefins, polyurethanes, polyvinylchloride and polystyrene, and 0.05—40% by weight of at least one sulphonic acid containing compound which is synthesized by sulphonating an epihalohydrin homopolymer or an alkyleneoxide/epihalohydrin block copolymer.

3,637,901

EPOXY RESIN COMPOSITION CONTAINING A PREPOLYMER OF AN N,N'-BIS-IMIDE AND A DIAMINE

Michel Bargain, Lyon, and Max Gruffaz, La Mulatiere, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed May 28, 1970, Ser. No. 41,583
Claims priority, application France, May 30, 1969, 6917862
Int. Cl. C08g *45/06, 45/12*
U.S. Cl. 260—830 P 9 Claims

Cured epoxy resins of good heat resistance are made by heating an epoxy resin with a prepolymer melting below 200° C. made from an N,N'-bis-imide, e.g. N,N'-4,4'-diphenylmethane-bis-maleimide, and a diamine.

3,637,902

EPOXIDE RESINS CURED WITH AMINE-GLYCIDYL ESTER ADDUCTS IN ADMIXTURE WITH A PHENOLIC ACCELERATOR

Clifford F. Dukes, Jeffersontown, and George B. Scott, Louisville, Ky., assignors to Celanese Coatings Company, New York, N.Y.

No Drawing. Filed Aug. 26, 1969, Ser. No. 853,204
Int. Cl. C08g *45/06*
U.S. Cl. 260—830 TW 8 Claims

Room temperature curable compositions useful in coatings, floor topping, moldings, encapsulations and other plastics applications are prepared from a blend of an epoxide resin, an amine-glycidyl ester adduct and a phenolic accelerator.

3,637,903

DIIMINE CATALYZED REACTION PRODUCTS HAVING IMPROVED ADHESIVE PROPERTIES

Bernardas Brizgys, Southgate, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Continuation-in-part of application Ser. No. 738,772, June 21, 1968. This application Sept. 15, 1969, Ser. No. 858,122
Int. Cl. C08g *41/04, 45/12*
U.S. Cl. 260—830 P 10 Claims

Adhesive coating compositions are prepared by mixing and reacting in the presence of certain diimine compounds (1) an organic polyol, (2) an epoxy resin, (3) an organic polyisocyanate, and (4) various fillers and pigments. Such coatings exhibit excellent adhesion to concrete, asphalt and the like.

3,637,904

MONOANHYDRIDE, OLEFIN-MALEIC ANHYDRIDE COPOLYMER, POLYEPOXIDE CASTING RESINS

Walter P. Barie, Jr., Shaler Township, Allegheny County, and Norman W. Franke, Penn Hills Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Dec. 18, 1969, Ser. No. 886,391
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 11 Claims

New compositions of matter for forming castings made from a polyepoxide, a monoanhydride and a solid polyanhydride wherein the polyanhydride has at least three anhydride groups and the monoanhydride is soluble in the polyepoxide. The compositions are prepared by first mixing the monoanhydride and the polyepoxide and then adding the polyanhydride in a second stage to produce a clear homogeneous casting liquid.

3,637,905

HYDANTOIN-FORMALDEHYDE RESIN MODIFIED POLYPROPYLENE

Patrick W. Ager, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed Feb. 27, 1969, Ser. No. 803,092
Int. Cl. C08g *37/32*; D06p *3/04*
U.S. Cl. 260—854 9 Claims

Polypropylene compositions comprising a highly polymeric polypropylene resin containing a minor amount of a hydantoin-formaldehyde resin.

3,637,906

ORIENTED THERMOPLASTIC FILMS AND METHOD OF PRODUCING SAME

Rene Le Parathoën, Saint-Maurice-de-Beynost, France, assignor to La Cellophane, S.A., Paris, France

No Drawing. Filed Feb. 9, 1968, Ser. No. 704,266
Claims priority, application France, Feb. 17, 1967, 95,359
Int. Cl. D01f *1/02*; C08g *41/04*
U.S. Cl. 260—857 L 4 Claims

Oriented thermoplastic films are produced by stretching a film of a thermoplastic polymer to which has been added at least one other thermoplastic polymer having a different crystalline melting point. An oriented thermoplastic film having an opalescent effect is achieved.

3,637,907

POLYOLEFINS STABILIZED WITH DIPHOSPHINES

Ronald D. Mathis, Bartlesville, Okla., and Leslie T. Netherton, Fayetteville, Ark., assignors to Phillips Petroleum Company

No Drawing. Filed Feb. 26, 1969, Ser. No. 802,660
Int. Cl. C08f *29/10, 45/58*
U.S. Cl. 260—857 L 6 Claims

The stability of polyolefins is improved by adding a small amount of an alkylene diphosphine.

3,637,908

PRODUCTION OF POLYACRYLONITRILE FILAMENTS

Heinz Pohlemann, Limburgerhof, Rolf Wurmb, Heidelberg, Joachim Kunde, Frankenthal, and Bernd Stanger, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed July 9, 1969, Ser. No. 840,515
Claims priority, application Germany, July 9, 1968, P 17 69 762.0
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 R 4 Claims

Production of antistatic filaments, threads or fibers based on acrylonitrile polymers by spinning solutions of these polymers in organic solvents, the solutions containing oxyalkylated synthetic linear polyamides.

3,637,909

POLYURETHANES PROCESS AND PRODUCT PREPARED FROM ALIPHATIC POLYCARBONATES CONTAINING IN SITU POLYMERIZED UNSATURATED COMPOUNDS

Wulf von Bonin, Erwin Muller, and Kuno Wagner, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 9, 1969, Ser. No. 840,474
Claims priority, application Germany, July 15, 1968, P 17 69 795.9
Int. Cl. C08f *29/10*; C08g *39/10, 22/08, 41/00*
U.S. Cl. 260—859 R 7 Claims

Polyurethanes and a process for preparing them in which polyisocyanates are reacted with aliphatic polycarbonates containing at least two hydroxyl groups and having a molecular weight of 800 to 3000, which polycarbonates have been prepared by polymerizing unsaturated compounds in situ, if desired with formation of graft polymers.

The hydrolytically stable polyurethanes of this invention are highly advantageous for use in any application in which hydrolytic conditions may be encountered such as, for example, bathtub mats, kitchen aids, gears, molded parts, gaskets, O-rings, shoe heels, shock absorbers and so on.

3,637,910

PROCESS FOR THE PREPARATION OF FIBER-FORMING AROMATIC POLYESTERS OF LOW FREE CARBOXYL GROUP CONTENTS

Takeo Shima, Takanori Urasaki, and Isao Oka, Iwakunishi, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Sept. 5, 1969, Ser. No. 855,778
Claims priority, application Japan, Sept. 9, 1968, 43/64,831; Apr. 12, 1969, 44/28,526
Int. Cl. C08g *17/04, 17/08, 39/10*
U.S. Cl. 260—860 24 Claims

High molecular fiber-forming aromatic polyesters having a low free carboxyl content and a high resistance to wet heat are prepared by adding a compound such as diglycol esters of oxalic acid, substituted or unsubstituted malonic acid, or polymers of such diglycol esters, and substituted or unsubstituted cyclic glycol esters of oxalic acid to a molten mass of an aromatic polyester derived from an aromatic dicarboxylic or its lower aliphatic esters such as terephthalic acid and a dihydric alcohol such as ethylene glycol, such molten mass of the polyester having an intrinsic viscosity of at least 0.3, and subjecting the molten mass of aromatic polyester to which conditions as will allow further progress of the polycondensation reaction.

3,637,911

CHEMICALLY THICKENED POLYESTER RESIN

Melvin E. Baum, Monroeville, Pa., and John A. Hatton, Jr., Madeira, Ohio, assignors to Koppers Company, Inc.

Filed Apr. 15, 1970, Ser. No. 28,600
Int. Cl. C08f *1/60, 21/02*
U.S. Cl. 260—865 4 Claims

The viscosity of unsaturated polyester resins formed by mixing the condensation polymers of unsaturated dicarboxylic acids and dihydric alcohols in ethylenically unsaturated copolymerizable monomers may be greatly increased by adding (1) a mixture of calcium oxide and either calcium hydroxide or magnesium oxide, and (2) an organic acid selected from the group consisting of benzoic acid, cyclohexane carboxylic acid, cinnamic acid and p-hydroxybenzoic acid to the unsaturated polyester resins.

The viscosity of the composition is initially low enough so that fibrous reinforcements can be impregnated with the resin composition and the low viscosity permits the resin to wet the fibers, thereafter the viscosity of the resin increases and the fibrous reinforced mass loses its tackiness and can be easily stored and handled.

ELECTRICAL

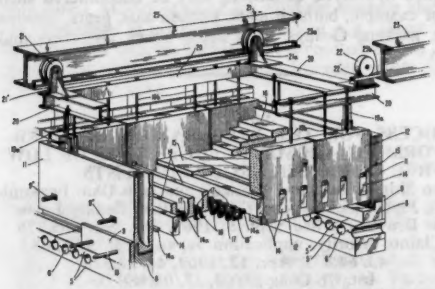
ERRATUM

For Class 424—270 see:
Patent No. 3,637,707

3,637,912
FURNACE FOR GLASS PROCESSES

Claude E. Bernard, Neuilly-sur-Seine, France, assignor to Compagnie De Saint-Gobain-Pont-A-Mousson, Neuilly-sur-Seine, France

Filed Apr. 2, 1970, Ser. No. 25,172
Claims priority, application France, Apr. 3, 1969, 6910300
Int. Cl. F27b *9/28*
U.S. Cl. 13—6 **21 Claims**

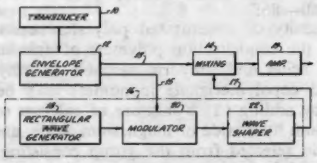


A tunnel furnace comprising a floor, sides, and a vault composed of refractory material, the vault being comprised of independently movable sections suspended from carriage means aligned transversely to the longitudinal axis of the furnace whereby each section may be removed independently from the furnace, each sec movable section of the vault comprising refractory walls and a floor suspended from the carriage means and constituting a bin adapted to the reception of refractory, heat-retaining material.

3,637,913
TONE GENERATOR EMPLOYING ASYMMETRICAL WAVE GENERATOR RECTANGULAR

Chauncey R. Evans, Costa Mesa, Calif., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed July 27, 1970, Ser. No. 58,239
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **24 Claims**



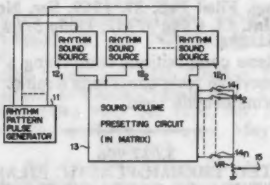
A tone generator for an individual note of an electronic piano comprises an oscillator that provides an asymmetrical rectangular wave having a duty cycle of at least four to one. The rectangular wave is fed to a clipping diode gate where it is amplitude modulated in accordance with a signal envelope generated by the player of the piano. A capacitor is connected across the modulator output or, alternatively, connected within the modulator, to provide a modulated rectangular wave with a substantially sawtooth wave form.

Other instrument sounds may be provided and a tone control is achieved by duty cycle variation. Performance of a power amplifier is enhanced by driving it with a rectangular wave.

3,637,914
AUTOMATIC RHYTHM SOUND PRODUCING DEVICE WITH VOLUME CONTROL

Ryu Hiyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Mar. 15, 1971, Ser. No. 124,257
Claims priority, application Japan, Mar. 16, 1970, 45/24808
Int. Cl. G10f *1/00*
U.S. Cl. 84—1.03 **5 Claims**

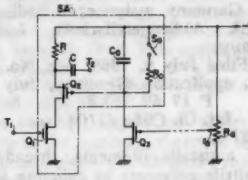


Device includes a rhythm pattern pulse generator to generate a set of rhythm pattern pulses selected from plural sets of rhythm patterns. Each rhythm pattern pulse of the selected set triggers each individual rhythm sound source so as to constitute, by the combination of the outputs of the triggered sources, a predetermined rhythm sound performance. The outputs of the rhythm sound sources are supplied to a sound volume presetting circuit the respective inputs of which are selectively connected to respective rhythm output lines through resistors having predetermined values in accordance with the kinds of the rhythms to be played, and the output lines are connected to an output terminal through respective rhythm selector switches to be closed upon selection of the kind of rhythm performances.

3,637,915
SUSTAIN KEYER CIRCUITRY WITH SUSTAIN TIME CONTROL CIRCUIT IN ELECTRONIC MUSICAL INSTRUMENT

Katsuhiko Hirano, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Apr. 9, 1970, Ser. No. 27,027
Claims priority, application Japan, Apr. 14, 1969, 44/33943
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.13 **13 Claims**



A sustain keyer circuitry in electronic musical instrument having two field effect transistors connected in series to each

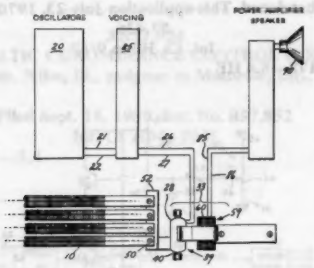
other, the source electrode of the first FET being grounded and the gate electrode thereof being adapted to receive tone signals, the drain electrode thereof being connected to the source electrode of the second FET whose drain electrode is connected to the power source via a load resistor, the gate electrode of said second FET being connected to keying means having a key-operated switch and capable of keying the control voltage to be applied to the gate electrode of said second FET, so that, by the keying operation of said key-operated switch, said tone signal is derived across the load resistor, said circuitry being arranged so that the on-off ratio, i.e., the conducting to nonconducting level ratio of the tone signal, is increased substantially whereas, accordingly, the load in a tone generator is reduced. By incorporating, in said sustain keyer circuitry, a sustain time control circuit, i.e., an envelope-forming circuit, which is formed by the use, in a charging and discharging circuit which is employed as the time constant circuit for determining the sustain time of said electronic musical instrument, of a capacitor of a relatively low capacitance and a third FET having an extremely high inner impedance and being used as a variable resistance element, said circuitry can be easily integrated.

3,637,916

ELECTRONIC MUSICAL INSTRUMENT EMPLOYING DIFFERENTIAL TRANSFORMER FOR SIGNAL COUPLING

Alvin S. Hopping, Nolan's Point, Lake Hopatcong, N.J.

Filed Apr. 15, 1970, Ser. No. 28,570
Int. Cl. G10c *3/20*
U.S. Cl. 84—1.15 **3 Claims**



An electronic musical instrument in which electronically generated tones are coupled from a generating system to a power amplifier by a differential transformer in which primary and secondary windings are normally disposed transversely to each other on respective open cores which are normally disposed in parallel, proximate relationship to effect null transfer of signal, and which are moved with respect to each other to effect desired transfer of signal.

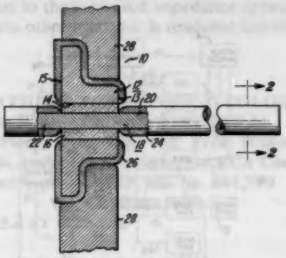
3,637,917

HERMETIC HIGH-CURRENT THERMINAL FOR ELECTRONIC DEVICES

William Lee Oates, Bernardsville, N.J., assignor to RCA Corporation

Filed Mar. 10, 1971, Ser. No. 122,672
Int. Cl. H01b *17/26*
U.S. Cl. 174—152 GM **6 Claims**

A metallic conductor extends through an insulating material disposed in an opening of a sleeve and has an expansion coefficient closely matching that of the insulating material. A relatively thick copper layer is disposed only on the outer end portions of the conductor.

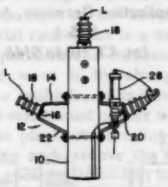


3,637,918

FUSE AND ARRESTER INSERT BRACKET

Randolph A. Pasen, Dearborn Heights, Mich., assignor to The Detroit Edison Company, Detroit, Mich.

Filed Mar. 20, 1970, Ser. No. 21,420
Int. Cl. H01b *17/16*
U.S. Cl. 174—158 R **10 Claims**



A bracket for attachment to a standoff insulator bracket having a generally horizontally upper arm, a downwardly and slightly outwardly inclined insulator support portion, and a downwardly and inwardly inclined lower brace arm. The insert bracket extends laterally of the insulator bracket and provides extending arms to which electrical components such as fuse and lightning arrester devices may be mounted. The insert bracket is designed to support the electrical components generally within an area limited by the outer ends of insulators carried by the insulator brackets.

3,637,919

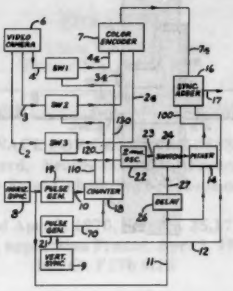
COLOR TELEVISION EQUIPMENT

David S. McVoy, Gainesville, Fla., assignor to Coaxial Scientific Corporation, Alachua, Fla.

Filed July 13, 1970, Ser. No. 54,411
Int. Cl. H04n *9/34*
U.S. Cl. 178—5.2 R **10 Claims**

Color television equipment includes a system in which a frame of video information is transmitted by sequentially transmitting the video signals so that for successive lines being scanned the transmitted signal will be representative of red, green and blue light, respectively. At the end of the frame the phase of the sequence shifts so that for each line in the next frame the transmitted signal will represent a color that is different for that line in the previous frame. At the end of the third frame the red, green and blue video outputs for each line will have been transmitted. Counters and related circuitry in the transmitter and in a compatible receiver are

utilized to display the signals in proper synchronism in the three-electron-gun CRT of the receiver. The foregoing line



sequential system may be utilized in a videotape recorder which records and retransmits video signals.

3,637,920

METHOD AND SYSTEM FOR CORRECTING COLOR ERRORS IN THE TELEVISION-SCANNING OF COLOR FILMS

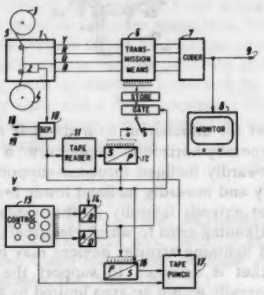
Werner Becker, Erfelden, and Hans Horneff, Darmstadt, both of Germany, assignors to Fernseh GmbH, Darmstadt, Germany

Filed July 31, 1970, Ser. No. 59,913

Claims priority, application Germany, Aug. 2, 1969, P 19 39 515.4

Int. Cl. H04n 9/48

U.S. Cl. 178—5.2 **20 Claims**



A system for correcting color errors in color films for television transmission. Machine-readable scene markers are placed on the film for each scene, the film is initially screened, being stopped at each marker, and the appropriate correction factors are derived and recorded for each scene, whereby the recorded correction factors are used for automatically correcting the color errors when the film is subsequently run for transmission.

3,637,921

LUMINANCE AMPLIFIER WITH BLACK LEVEL STABILIZATION CONTROL

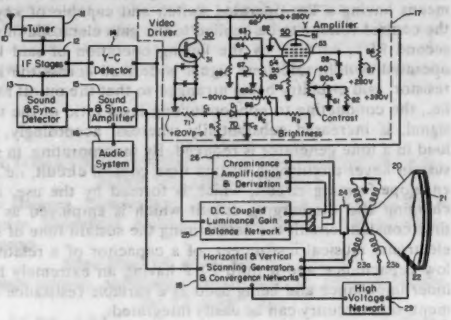
Dennis G. Abel, Hanover Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 9, 1970, Ser. No. 1,650

Int. Cl. H04n 9/12, 5/16

U.S. Cl. 178—5.4 R **5 Claims**

A luminance amplifier circuit with black level stabilization control for a color television receiver wherein a variable DC control signal is derived from an applied composite video signal, the magnitude of which is directly dependent upon the white content of the instantaneous received signal. The derived DC control signal upon combining with the alternating components at the input of the luminance amplifier maintains a true DC level for the processed luminance signal as applied to the image display tube under varying signal input levels to aid DC operating characteristics of the luminance amplifier device.



3,637,922

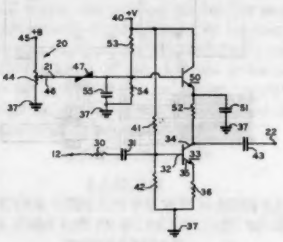
VARIABLE PHASE SHIFT CIRCUIT AND METHOD

Gopal Krishna Srivastava, Batavia, N.Y., assignor to Sylvania Electric Products Inc.

Continuation of application Ser. No. 25,215, Apr. 2, 1970, now abandoned. This application July 23, 1970, Ser. No. 57,436

Int. Cl. H04n 9/12

U.S. Cl. 178—5.4 HE **18 Claims**



A variable phase shift circuit and method is disclosed wherein a transistor is biased at a sufficiently low level such that the transistor exhibits a substantial capacitive coupling between the base and collector whereby the output signal taken from the collector is of a phase, with respect to the input signal applied at the base, substantially less than 180°. The phase shift is varied by varying the potential difference between the collector and base thereby varying the reactive coupling between the base and collector.

3,637,923

AUTOMATIC BRIGHTNESS LIMITER

Dwight J. Poppy, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

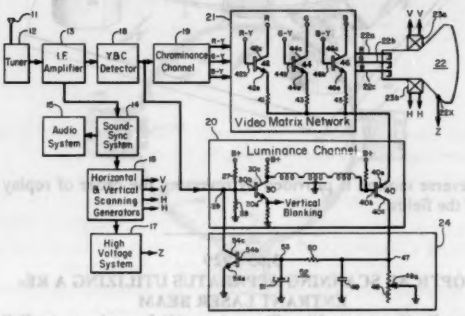
Filed Oct. 30, 1970, Ser. No. 85,354

Int. Cl. H04n 9/12

U.S. Cl. 178—5.4 R **6 Claims**

An automatic brightness limiter circuit in a color television receiver for limiting the average beam current in an image

reproducer due to color programming requiring high-beam current levels and/or high-background brightness signals. The limiter circuitry utilizes the total composite video signal developed by the output stage of the luminance processing channel in conjunction with the video matrix network to activate a feedback network whenever the total composite video signals exceed a predetermined safety level. Control signals generated by the feedback network at its output ter-



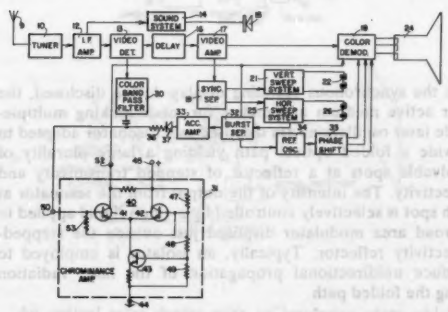
minal are coupled to a luminance driver amplifier to vary the quiescent bias potential thereof and consequently reduce the amplitude of the luminance signals applied to the image reproducer. The limiter circuitry further includes an integrating network for averaging the control signals to provide a substantially steady-state potential representative of the average beam current developed by the image reproducer during the previous scanning field.

3,637,924

AUTOMATIC CHROMINANCE CONTROL CIRCUIT

Gildo Cecchin, Niles, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 15, 1969, Ser. No. 857,852
Int. Cl. H04n 9/48
U.S. Cl. 178—5.4 **8 Claims**



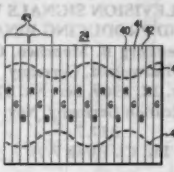
An automatic chrominance control (ACC) circuit for a color television receiver is used with a chrominance amplifier in the form of an integrated circuit differential amplifier operated with a constant current source. In order to reduce the number of bonding pads required for the amplifier, the ACC control voltage and the input signal are applied in common to a bonding pad coupled to the base of one of the transistors of the differential amplifier. The other transistor is supplied with a biasing potential, and a resistor interconnects the bases of the transistors to prevent signal lockout by causing the transistor to which the signals are applied always to conduct the same or more current than the other transistor. Increased conductivity of the first transistor causes a reduced gain thereof due to the increased impedance appearing on its emitter when the other transistor is rendered less conductive.

3,637,925

SYSTEM AND FILTER FOR ENCODING COLOR IMAGES ONTO BLACK AND WHITE FILM

Robert Earl Flory, Princeton, and Fred William Spong, Lawrenceville, both of N.J., assignors to RCA Corporation

Filed Sept. 29, 1969, Ser. No. 861,709
Int. Cl. H04m 9/06
U.S. Cl. 178—5.4 ST **13 Claims**



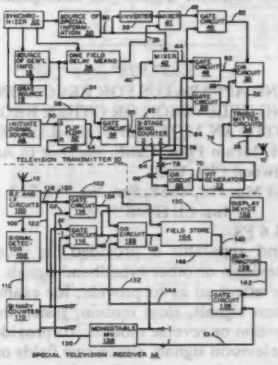
In a system for encoding color motion picture film onto black and white panchromatic film for subsequent playback and presentation as a color image on a color television picture tube whereby the hue and saturation of the color image is contained as phase and amplitude modulation of a carrier wave derived from scanning of the encoded black and white film, a spatial color encoding filter is provided for encoding a reference carrier wave along with the colored images. The transmissivity to white light of the encoding stripes of the filter varies at a spatial rate which is a multiple, including a submultiple, of the spatial rate or frequency of the encoding stripes. A reference wave is thereby provided having a frequency which is a multiple, or submultiple, as the case may be, of the above-mentioned carrier wave. The reference wave is utilized in the playback-decoding process to decode the color carrier wave and retrieve the hue and saturation corresponding to the encoded color film images.

3,637,926

SYSTEM FOR TRANSMITTING TWO CLASSES OF SUPERIMPOSED INFORMATION

Charles A. Morchand, New York, N.Y., assignor to Data-Plex Systems, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 754,013, Aug. 20, 1968, now abandoned. This application Oct. 2, 1968, Ser. No. 764,523
Int. Cl. H04n 7/08
U.S. Cl. 178—5.6 **10 Claims**



A television system comprises a television transmitter and a television receiver. The television transmitter includes a

source of fields of first or general viewer information and a source of at least one field of second special viewer information. Means superimposed at least a portion of the field of second viewer information on a field of first viewer information to create at least one superimposed field. The fields of first viewer information are transmitted with the superimposed field or fields interposed therein. The television receiver receives the transmitted fields. Included in the receiver are means for separating out from the superimposed field or fields the field of second viewer information or portion thereof and for displaying that field of second viewer information.

3,637,927

COMPARING TELEVISION SIGNALS WITH VARIED THRESHOLD AND PRODUCING BINARY SIGNALS

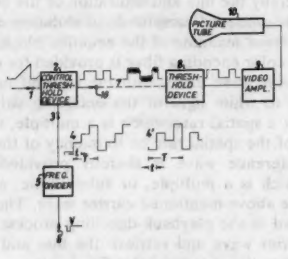
Gerhard Krause, Ebersberg B. Munchen, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed Nov. 12, 1969, Ser. No. 875,771

Claims priority, application Germany, Nov. 16, 1968, P 18 09 357.7

Int. Cl. H04h 7/10

U.S. Cl. 178—6 **20 Claims**



A reference voltage is cyclically varied within a range of dark and bright television picture signals. Binary one signals are produced when an instantaneous picture brightness signal voltage is higher, i.e. brighter, than the instantaneous level of the cyclically varied reference voltage. Zeros indicate that the instantaneous value of the television signal is below the corresponding instantaneous level of the reference voltage. The binary signals are amplified when necessary, and are stored or transmitted to a receiver. The binary inputs are used directly in a conventional receiver, permitting the eye to integrate closely adjacent signals to distinguish levels of brightness.

3,637,928

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING TELEVISION OR OTHER BROADBAND SIGNALS WITH AN ALTERED TIME BASE EFFECT

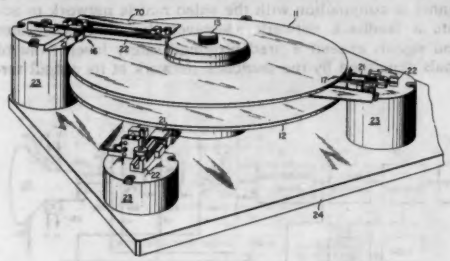
Anthony Poulett, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 18, 1968, Ser. No. 713,732

Int. Cl. H04n 5/78

U.S. Cl. 178—6.6 FS **7 Claims**

A method and apparatus is provided for recording and reproducing television or other broadband signals with an altered time base effect so as to provide, for example, in the case of television signals, slow motion, faster than normal motion, stop motion or reverse motion. To provide slow motion replay of television signals, successive fields of the signal are recorded separately on a plurality of magnetic mediums, and at predetermined head-to-medium writing speeds, and are played back at substantially the same head-to-medium writing speeds. On playback, each field is repeated a number of times depending upon the time base effect desired.



Reverse motion is provided by reversing the order of replay of the fields.

3,637,929

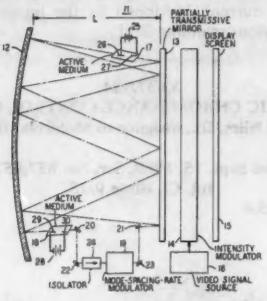
OPTICAL SCANNING APPARATUS UTILIZING A RE-ENTRANT LASER BEAM

Ivan P. Kaminow, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 30, 1968, Ser. No. 763,778

Int. Cl. H04n 3/02; H01s 3/08; H04b 9/00

U.S. Cl. 178—7.3 **5 Claims**



In the synchronous scanning display device disclosed, the laser active medium and means for mode-locking multiple-mode laser oscillations are disposed in a resonator adapted to provide a folded optical path yielding a large plurality of resolvable spots at a reflector of stepped transmissity and reflectivity. The intensity of the output from the resonator at each spot is selectively controlled by a video signal applied to a broad area modulator disposed just outside the stepped-reflectivity reflector. Typically, an isolator is employed to produce unidirectional propagation of the laser radiation along the folded path.

3,637,930

YOKE-RETAINING DEVICE

James L. Meier, Des Plaines, Ill., assignor to Admiral Corporation, Chicago, Ill.

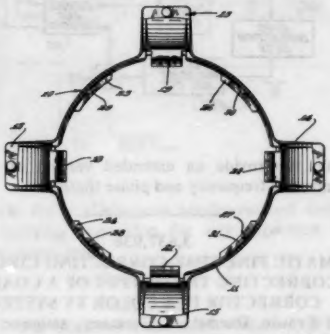
Filed Nov. 6, 1969, Ser. No. 874,528

Int. Cl. H01j 29/70; H01f 7/00

U.S. Cl. 178—7.8 **11 Claims**

A device for positioning a deflection yoke about the gun portion of a cathode-ray tube. The yoke-retaining device is formed of a molded plastic material and has a collar or ring portion which is supported against the rear envelope of the

tube by a series of integrally formed leg members. The collar portion has a series of integrally formed springlike tabs which project radially inwardly of the retainer to center the yoke within the ring. The tablike spring members hold the yoke firmly in directions transverse to the axis of the retainer, while permitting free movement of the yoke in the axial



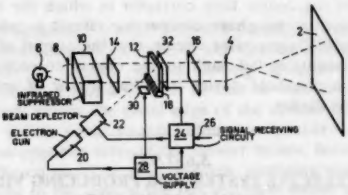
direction. A series of flanges are provided at the leg side of the collar portion to confine the yoke within the retaining device. Each of the flanges has a guide rib associated therewith extending in the axial direction at spaced points along the inner surface of the collar portion. These ribs prevent substantial pivoting of the yoke as it is being positioned within the yoke retainer.

3,637,931

OPTIC RELAY FOR USE IN TELEVISION

Jacques Donjon, Yerres; Auguste Raymond Le Pape, Vitry Chatillon, and Gerard Joseph Marcel Marie, L'Hay les Roses, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,463
Claims priority, application France, Dec. 20, 1968, 179505
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.5 BD **6 Claims**



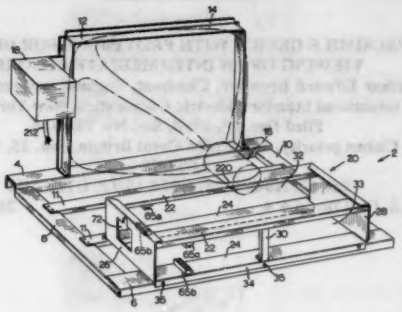
An optical relay device with an insulating plate which is ferroelectric below its Curie temperature. The plate is scanned by an electron beam. The plane of polarization of light incident on the plate is variably rotated in dependence upon the electric field created by means of the interaction between the electron beam and a signal voltage applied to the plate, due to the Pockels effect. The temperature of the plate is stabilized in the proximity of its Curie temperature. This stabilizing device uses a capacitor as a temperature sensing element. The dielectric of the capacitor is formed by a material having a Curie temperature differing from that of the plate by between 1° and 20°.

3,637,932

TELEVISION SET CHASSIS HAVING VERTICAL PLUG IN CIRCUIT BOARDS

Patrick A. Wigley, Scarborough, Ontario, Canada, assignor to Clairtone Sound Corporation Limited, Rexdale, Ontario, Canada

Filed July 7, 1969, Ser. No. 839,356
Claims priority, application Canada, June 13, 1969, 054,257
Int. Cl. H01j *29/02*
U.S. Cl. 178—7.9 **11 Claims**



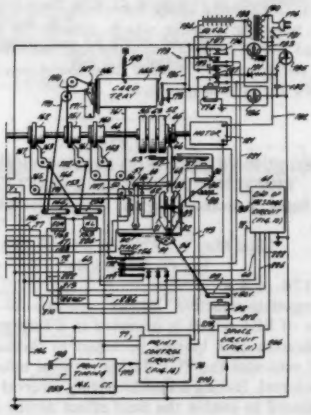
A color television set chassis extending across the rear edge of the set and containing plug-in circuit boards orientated in a vertical plane and extending in a front to rear direction. The boards are inserted and removed from the rear and plug into an interconnecting board across the front of the chassis, with controls on the boards projecting through the rear cover of the set. The chassis is open at its top and bottom for ventilation. The tuner assembly is located at one side of the chassis, and the boards contain components arranged in a specific order which both separates the functions as between the boards and also simplifies the wiring needed.

3,637,933

ALPHA-NUMERIC PRINT SYSTEM USING THREE PRINTING WHEELS

Arnold M. Wolf, Brooklyn, and John G. Richter, Yonkers, both of N.Y., assignors to Electrospace Corporation, Glen Cove, N.Y.

Filed Nov. 12, 1969, Ser. No. 875,794
Int. Cl. H04l *17/24*
U.S. Cl. 178—39 **7 Claims**



A printing system is described having three continuously rotating print wheels slidably mounted adjoining each other

on a splined shaft. A record sheet, which may be a card or a sheet of paper is mounted adjacent the peripheries of the wheels and an electromagnetic hammer is mounted on the other side of the record sheet. The printing operation includes the actuation of the hammer in timed relationship to the position of the wheels. The wheels are shifted together by a single yoke to move a desired wheel into printing position. Three wheels are used in order to include all the alphabet characters, all the numerals from 0 to 9, and various other punctuation marks.

3,637,934

FACSIMILE DEVICE WITH PROVISIONS FOR DIRECT VIEWING OF AN INTERMEDIATE RECORD

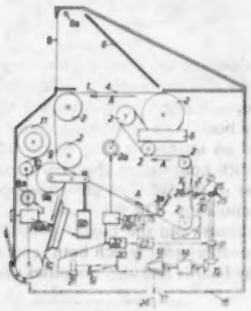
Arthur Edward Brewster, Cheshunt, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 13, 1968, Ser. No. 783,638

Claims priority, application Great Britain, Jan. 25, 1968, 3,894/68

Int. Cl. H04n *1/28*; **G01d** *15/12*; **G11b** *5/52*

U.S. Cl. 178—6.6 A **26 Claims**



The invention provides apparatus for displaying and printing information applied thereto via an image conversion system which forms part of the apparatus and which involves the mechanical scanning of a primary image by a detector unit. A magnetic recording head assembly mechanically coupled to the detector unit and electrically coupled to the image conversion system scans a magnetic recording surface in synchronism with the scanning action of the detector unit to build up a magnetic image subsequently displayed by dusting with magnetic powder which adheres to the magnetic image and which is wholly transferable therefrom to a permanent record. The primary and permanent images as viewed are the same way round.

3,637,935

KEYED SUBSTRATE FIELD EFFECT TRANSISTOR FREQUENCY-SELECTIVE CIRCUITS

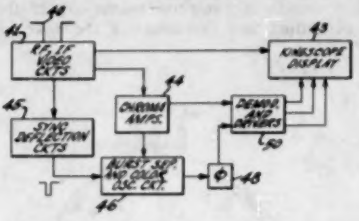
Tomoki Saeki, Kawasaki, Japan, assignor to RCA Corporation

Filed May 7, 1970, Ser. No. 35,463

Int. Cl. H04n *9/44*

U.S. Cl. 178—5.4 R **8 Claims**

A frequency-selective circuit utilizes a field effect transistor of FET which is operated in a saturation mode by the application of a biasing potential to the substrate. The potential saturates the FET during a signal information containing interval. During a synchronizing interval the substrate bias is altered to enable the field effect device to operate as an active amplifier. The FET then serves to amplify a signal of a predetermined frequency applied to the gate electrode and occurring during the synchronizing interval. The drain electrode of the field effect transistor is coupled to a high quality factor circuit which is responsive to the amplified output signal to provide an extended version of said signal synchronized in frequency and phase thereto.



3,637,936

AUTOMATIC FINE TIME-CORRECTING CIRCUIT FOR TIME CORRECTING THE OUTPUT OF A COARSE TIME CORRECTOR IN A COLOR TV SYSTEM

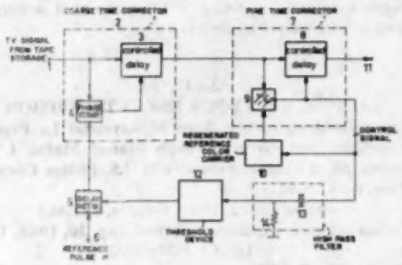
Gerhard Krause, Darmstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed Apr. 7, 1969, Ser. No. 813,865

Claims priority, application Germany, Apr. 13, 1968, P 17 62 131.7

Int. Cl. H04n *9/46*

U.S. Cl. 178—69.5 CB **5 Claims**



An automatic fine time-correcting circuit coupled to the output of the coarse time corrector in which the reference signal used in the phase comparator circuit is taken off a color carrier regenerator circuit, and the output of the fine time corrector is fed back to the coarse corrector circuit through a threshold device including a pair of antiparallel connected diodes.

3,637,937

A TELECINE SYSTEM FOR PRODUCING VIDEO SIGNALS FROM FILM

John Harwood Deveson, and Anthony John Butt, both of Essex, England, assignors to The Marconi Company Limited, London, England

Filed Sept. 10, 1969, Ser. No. 856,531

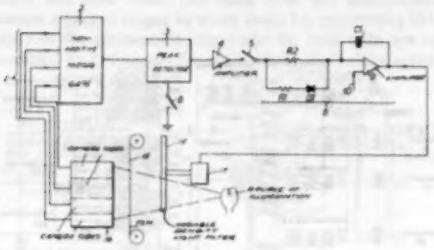
Claims priority, application Great Britain, Sept. 18, 1968, 44,273/68

Int. Cl. H04n *5/54*

U.S. Cl. 178—7.2 **12 Claims**

In a telecine equipment variations in exposure of the film can be disturbing to viewers. This invention provides a compensation for such variations which may be effected within the time of a small number of television field scans and employs a peak signal detector for determining during operation peak signal amplitude occurring during a predetermined

number of television fields and control means, which may vary the gain of the camera or video signal processing ampli-



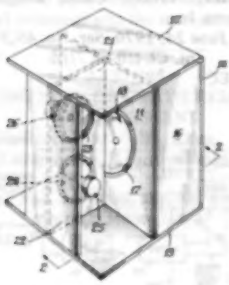
fier, operable for a subsequent predetermined number of fields for applying correction for any departure from a desired peak signal level.

3,637,938

STEREO SPEAKER ARRANGEMENT AND CIRCUIT

Herbert F. Kuhlow, Cleveland, Ohio; James F. Novak, La Grange Park, and John F. Henley, Country Club Hills, both of Ill., assignors to Pemcor, Inc.

Filed Aug. 6, 1969, Ser. No. 847,961
Int. Cl. H04r 5/02; G10k 13/00
U.S. Cl. 179—1 G **9 Claims**



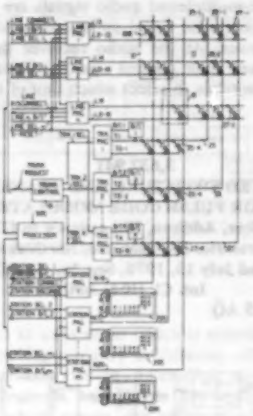
A sum speaker is placed behind a panelboard opening in an enclosure. Across the front of the opening and normal to the panel is divider means having speaker apertures therethrough. A baffle member at least as wide as the opening extends across the distal edge of the divider means and parallel to the panel board. Difference speakers are positioned on opposite sides of the divider means, facing in opposite directions. The sum speaker produces sound corresponding to the sum of the left and right stereo channels, while the difference speakers produce sound corresponding to the difference between the left and right channels, with the diaphragms of the difference speakers moving simultaneously in the same direction. This is achieved by a matrixing means comprising an autotransformer. The ends of the transformer coil are connected respectively to the ungrounded output terminal of the left and right channel amplifiers respectively. The difference speakers are connected across the ends of the autotransformer. The sum speaker is connected between the transformer centertap and the grounded output terminals of the two amplifiers. In one embodiment the sum speaker panelboard and the divider are vertical. In another embodiment the sum speaker panelboard is horizontal and the divider means comprises four wings positioned as a Greek cross, with different speakers on each of the wings.

3,637,939

LINE STATUS CONTROL FOR ELECTRONIC KEY TELEPHONE SYSTEM

Lucian Philip Fabiano, Jr., Denver, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 7, 1970, Ser. No. 35,435
Int. Cl. H04q 3/54
U.S. Cl. 179—18 ES **10 Claims**



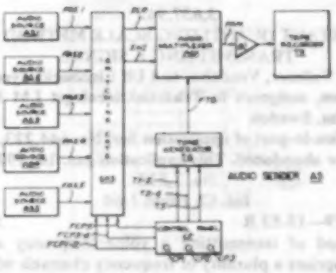
A key telephone system is disclosed in which switching functions are carried out in a central switching network instead of at the telephone set to reduce the amount of cabling in the system. The network is controlled by a processor associated with a memory unit containing a translation word for each station, each translation word containing the equipment location of the station and each of the lines accessible to the station. The processor employs the line equipment location to access the location in memory in which line activity need by stored only once in memory instead of repetitively in the translation word of each station having access to that line. The line activity word is protected against mistaken alteration by a phase bit.

3,637,940

MONOCHANNEL AUDIO TEACHING DEVICE

Charles A. Morchand, New York, and Don J. Dudley, Brightwaters, both of N.Y., assignors to Data-Plex Systems, Inc., New York, N.Y.

Filed May 18, 1970, Ser. No. 38,133
Int. Cl. H04j 9/00
U.S. Cl. 179—15 BM **10 Claims**



A monochannel audio teaching device comprises an audio sender which multiplexes several audio signals into a single

composite signal for transmission over single channel audio circuits for recording on the single channel magnetic tape, and an audio receiver which recovers the various audio signals from the single composite signal received. The sender provides inputs for two or more sources of audio information, related to, for example, multiple choice questions. Two frequency-multiplexed channels are provided and into each of these channels one or more audio signals can be fed on a time-multiplexed basis. Control signals precede each unit of information being time multiplexed. The control signals and Frequency/Time-multiplexed audio signals are combined to form a single composite signal or recording for subsequent use at the receiver. At the audio receiver the signals are demultiplexed and their control signals cooperate with student operated switches to select which unit of information is to be heard.

3,637,941

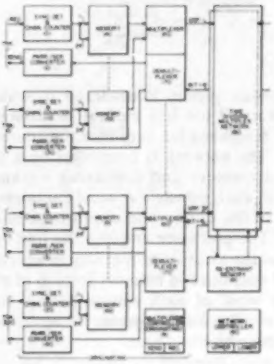
INTEGRATED SWITCHING AND TRANSMISSION NETWORK FOR PULSE CODE MODULATED SIGNALS

Bernard J. Rekiere, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 13, 1970, Ser. No. 54,481

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 AQ **8 Claims**



A time-division multiplex switching network and associated control. The network is capable of accepting digitally multiplexed carrier signals, performing the necessary functions of frame aligning, channel switching and channel reassigning required by an integrated switching and transmission system. To overcome blocking, time slot interchange capability is provided by allowing selective access to common storage locations via the switching network.

3,637,942

CONSTANT QUANTIZING SCALE METHOD OF TRANSMITTING A SIGNAL

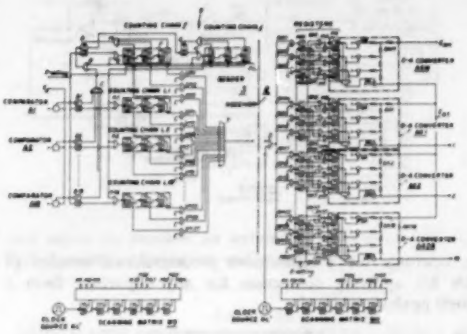
Burghardt Vollmer, Vendelso, and Ulf Lindback, Tyreso, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation-in-part of application Ser. No. 644,223, June 7, 1967, now abandoned. This application Jan. 14, 1970, Ser. No. 2,815

Int. Cl. H04b *1/66*

U.S. Cl. 179—15.55 R **5 Claims**

A method of transmitting a voice frequency spectrum which comprises a plurality of frequency channels wherein in each channel there is a voltage signal whose amplitude represents the intensity of a different discrete frequency component of the spectrum. The voltage signals of all channels are simultaneously compared against an exponentially decreasing reference voltage until an equality is obtained between the reference voltage and the voltage signal of the channel having the greatest intensity. A binary-coded representation of this intensity is recorded. Thereafter, bi-



nary-coded representations of the differences between the intensities of the channels with respect to the maximum intensity are recorded. These differences are also obtained by comparing the voltage signals of the channels with the reference voltage which is still exponentially decreasing.

3,637,943

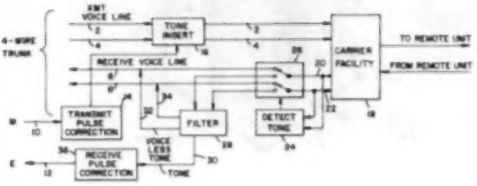
TELEPHONE-SIGNALING UNIT

Klaus Ernst Funke, Novato, Calif., assignor to Digital Telephone Systems, Inc.

Filed June 24, 1970, Ser. No. 49,399

Int. Cl. H04m *7/16*

U.S. Cl. 179—16 EC **14 Claims**



An in-band telephone-signaling unit of the type useful in carrier trunk systems is disclosed having receive and transmit pulse correction circuits and a band stop/band-pass filter for using an idle channel for supervisory purposes. The transmit pulse correction circuit provides constant length pulses in response to varying length pulses; the receive pulse correction circuit looks for pulses longer than a predetermined length and generates pulses having a constant duty cycle. The bandstop/band-pass filter employs a resonant arm in an active resistance bridge configuration.

3,637,944

PATH-FINDING SYSTEM FOR RELAY-TYPE CROSS-POINT MATRIX NETWORKS

Klaus Gueldenpfennig, Penfield, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

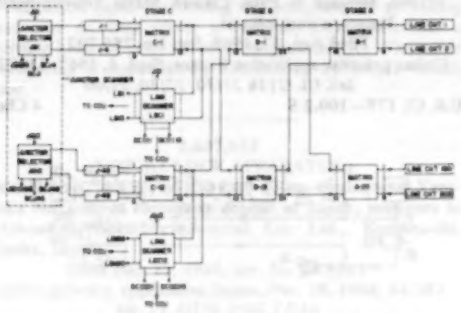
Continuation-in-part of application Ser. No. 782,078, Dec. 9, 1968, now Patent No. 3,585,309. This application Nov. 25, 1970, Ser. No. 92,566

Int. Cl. H04q *3/49*

U.S. Cl. 179—18 GE **6 Claims**

A path-finding system for interconnection of circuits through a switching network, wherein the network includes a

plurality of matrix stages interconnected to provide plural paths between circuits connected to opposite ends of the network and wherein each stage is divided into separate matrix groups. The matrix groups comprise cross-point relays having control and hold coils. The mark coils are interconnected between adjacent stages by mark leads for controlling the actuation of the cross-point relays and the hold coils are interconnected by hold leads for maintaining the relays actuated.



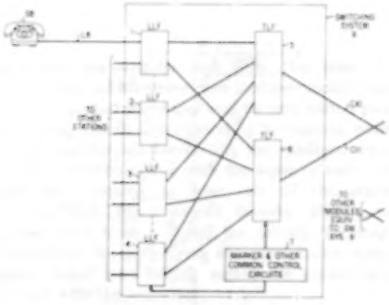
Guard relays are included in the mark leads between two of the matrix stages. The circuits at opposite ends of the network to be connected are marked. The busy-free conditions of the individual hold leads connected to a selected one of the matrix groups between two of the network stages are scanned to locate a free path. A circuit responsive to the detection of a free hold lead completes the connection through the network and interconnects the marked circuits.

3,637,945

SWITCHING NETWORK PATH RESERVATION ARRANGEMENT

Kenneth F. Giesken, Westerville, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 26, 1969, Ser. No. 879,995
Int. Cl. H04q *3/495*
U.S. Cl. 179—18 E **11 Claims**



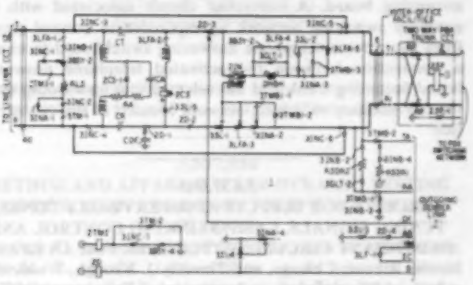
A switching system is arranged with control circuitry operative to identify a switching network link which will be required for a subsequent linkage path and to attempt to use the identified link as part of a preliminary linkage path and, in the alternative, to partially enable this link and thus render it "busy" simultaneously with the enabling of the preliminary linkage path. The arrangement thus insures the later availability of the identified link for use in the subsequent linkage path.

3,637,946

EQUIPMENT FOR CONTROLLING INTEROFFICE SIGNALING DURING A GLARE CONDITION

Harold E. Hamrick, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Bekeley Heights, N.J.

Filed Jan. 7, 1970, Ser. No. 1,136
Int. Cl. H04m *7/10*
U.S. Cl. 179—18 AH **10 Claims**



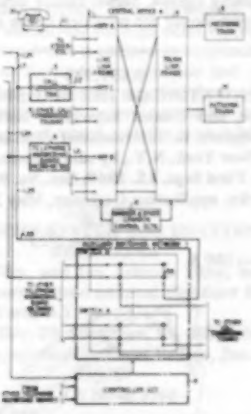
This pertains to equipment which is activated when automatic call switching circuitry at different offices simultaneously seize the same two-way interoffice trunk to complete different call requests. Included in this equipment is detection circuitry which causes one office to withdraw its call request enabling the other office to complete the call. A particular aspect of the invention concerns apparatus responsive to supervisory signals on the trunk for automatically converting the seizure signal forwarded by one office to an on-hook signal to prevent transmission of a premature acknowledgment signal to the other office.

3,637,947

CALL FORWARDING ARRANGEMENT FOR TELEPHONE ANSWERING SERVICE SYSTEMS

Charles Breen, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 22, 1969, Ser. No. 886,944
Int. Cl. H04m *5/50, 3/60*
U.S. Cl. 179—27 FH **11 Claims**



A central office, comprising a main switching network and control circuitry for interconnecting line circuit appearances

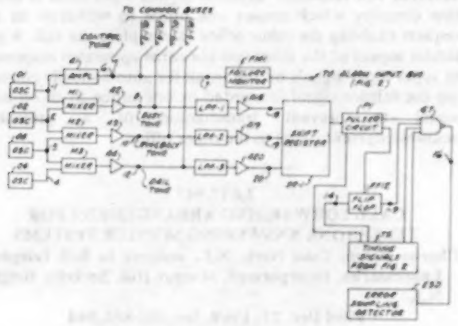
and trunk circuit appearance in the normal manner, is modified by the addition of an auxiliary switching network upon which are terminated telephone answering board incoming trunks and call forwarding trunks. These trunks also appear at respective remote telephone answering switchboards and each has a line circuit appearance in the main switching network. The system is arranged so that an incoming connection via a telephone answering board incoming trunk may be extended to a remote destination via a selected call forwarding trunk under control of the telephone answering board. A controller circuit associated with the auxiliary switching network is responsive to control signals from the remote telephone answering switchboard to enable a connection between the activated telephone answering board incoming trunk and the selected call forwarding trunk via the auxiliary switching network located at the central office.

3,637,948

CIRCUITS FOR SUPPLYING SUPERVISORY TONES, TUNING SIGNALS, LAMP BLINKING CONTROL AND REDUNDANT CIRCUIT SWITCHOVER FOR AN EPABX

Morris Ribner, Chicago, and Timothy J. Keough, Woodridge, both of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 13, 1970, Ser. No. 36,927
Int. Cl. H04m *1/26*
U.S. Cl. 179—84 R **9 Claims**



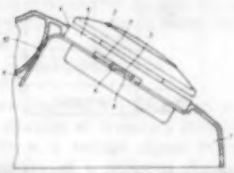
Integrated circuits are used to generate or form the tone supply for an electronic EPABX. Included are the supply of tones for line supervision and for ringing signal as well as internal DC timing signals. Signal failure detection and redundant circuit switchover are provided in the event of failure.

3,637,949

MOUNTING OF THE DIAL SWITCH

Heinz Ruster, and Gunter Schwanck, both of Berlin, Germany, assignors to International Standard Electric Corporation, New York, N.Y., by said Schwanck

Filed Sept. 15, 1969, Ser. No. 9,463
Claims priority, application Germany, May 29, 1969, P 19 27 441.0
Int. Cl. H04m *1/23*
U.S. Cl. 179—100 R **2 Claims**

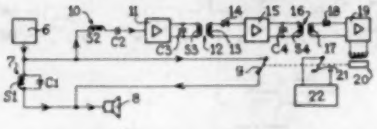


A dial switch is mounted inside a subset housing with the aid of a bayonet lock. Engagement in the end position is effected by means of a flexible latch detachably snapping into a groove of the housing.

3,637,950

RECORDING SYSTEM FOR SIMULTANEOUSLY PROJECTING PHOTOGRAPHIC IMAGES WITH A RECORDED COMMENTARY

Claude, Ansbert, Gaston, Gustave, Pierre Halley, Colombes, France, assignor to Paul, Claude, Marie Touvier-Berthet, Lyon, France, a part interest

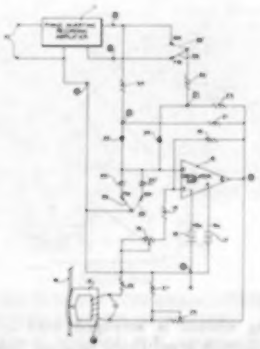
Filed Aug. 27, 1968, Ser. No. 755,702
Claims priority, application France, Sept. 4, 1967, 119825
Int. Cl. G11b *23/30, 27/30, 31/00*
U.S. Cl. 179—100.2 S **4 Claims**

Method and system for a simultaneous projection of photographic images associated with a recorded commentary. Electrical signals coming from the audio spectrum representing the commentary are recorded and a series of control pulses having a given carrier frequency and occuring at predetermined intervals are superimposed on the signals. The pulses are modulated with a signal having a frequency different from the carrier frequency. A switching means is actuated by detected and amplified modulating signals for actuating a photographic image changing device and short-circuiting a filter connecting a reading device to a loudspeaker.

3,637,951

RECORDING HEAD DRIVER WHICH AVOIDS SATURATION

Robert F. Brown, Jr., Dallas, Tex., assignor to Teledyne Industries-Geotech Division

Original application July 22, 1968, Ser. No. 746,546, now Patent No. 3,530,257, dated Sept. 22, 1970. Divided and this application Feb. 17, 1970, Ser. No. 12,051
Int. Cl. G11b *5/06*
U.S. Cl. 179—100.2 R **1 Claim**



An oscillatory circuit for driving a magnetic recording head to record analog intelligence signals in either one of two selectable modes, i.e., frequency modulation of a carrier supplied by the oscillator, or amplitude modulation resembling signals recorded by ordinary AC-biased techniques, the latter also being claimed as a method. The system employs the same oscillatory circuit in both cases, this circuit operating in

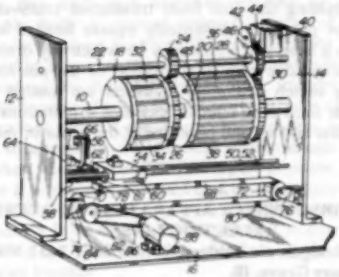
one mode as a voltage-controlled oscillator wherein both half-cycles of the oscillations are either lengthened or shortened depending upon the polarity of said analog input signal, and operating in the other mode in such a way that the analog input, depending upon its polarity, either shortens or lengthens one half-cycle of oscillation with respect to the other, whereby the zero axis of the oscillations is shifted up or down with changes in amplitude and polarity of the analog input signal to produce in the magnetic recording head a single oscillation signal resembling the composite of an analog signal plus AC-bias which is normally introduced into a recording head by prior art recording techniques. The mode of recording is conveniently determined by simple switch means.

3,637,952

VOICE CLOCK APPARATUS

Yukio Hataya, Neyagawa-shi; Isao Kozu, Osaka, and Yasutaka Nakashima, Neyagawa-shi, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma-shi, Osaka, Japan

Filed Dec. 22, 1969, Ser. No. 887,041
Claims priority, application Japan, Dec. 25, 1968, 44/282
Int. Cl. G11b *3/36, 27/14*
U.S. Cl. 179—100.2MD **2 Claims**



An apparatus for vocally indicating the time of day through a speaker, which comprises medium means having a magnetic layer applied thereover and formed with a plurality of tracks storing voices corresponding to various points of time, a clock mechanism for driving the medium means to shift the tracks in accordance with the lapse of time, a magnetic head for scanning at least one of the tracks to reproduce the time signal stored therein, driving means receiving the drive from a motor for driving the magnetic head, an amplifier for amplifying the reproduced output of the magnetic head, and switch means for connecting the magnetic head with the amplifier.

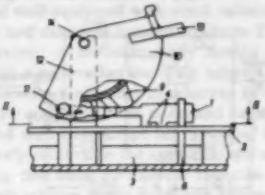
3,637,953

CRADLE SWITCH

Heinz Ruster, and Gunter Schwanck, both of Berlin, Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 15, 1969, Ser. No. 9,462
Int. Cl. H04m *1/08*
U.S. Cl. 179—164 **6 Claims**

A cradle switch is formed by a rocker having the shape of a cylinder section which, on its bent jacketing surface, is provided with switching cams which are capable of being moved



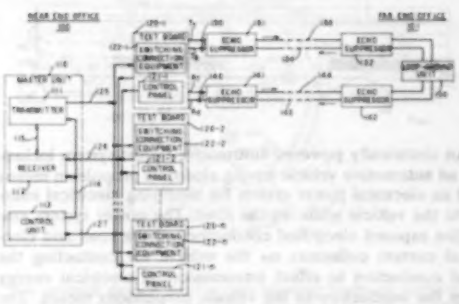
between contact springs mounted to move horizontally on a printed circuit board, and thus to actuate these contacts.

3,637,954

METHOD AND APPARATUS FOR DYNAMIC TESTING OF ECHO SUPPRESSORS IN TELEPHONE TRUNK SYSTEMS

Theodore C. Anderson; Roger D. Baum, both of Middletown; David L. Favin, Little Silver, and John J. Rugo, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 22, 1969, Ser. No. 826,893
Int. Cl. H04b *3/46, 3/20*
U.S. Cl. 179—175.31E **22 Claims**



Functional characteristics of echo suppressors in a telephone truck system are dynamically evaluated by propagating selected test signals, in a predetermined format tailored to the characteristic being evaluated, through the trunk system and selectively through echo suppressors in the system. An auxiliary trunk is utilized in conjunction with the trunk-under-test to facilitate transmission and reception of the test signals. Test signals are supplied from and evaluated by a master test unit, which is preprogrammed in accordance with the test being performed and the type echo suppressor being evaluated.

3,637,955

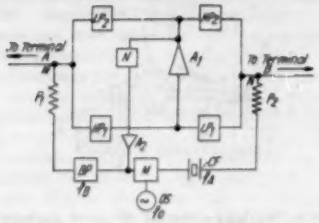
SUPERVISORY SYSTEM FOR UNATTENDED REPEATERS

John Frederick Tilly, and Ian Johnson Hirst, both of Kent, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,360
Claims priority, application Great Britain, Jan. 2, 1969, 219/69
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.31R **4 Claims**

A supervisory system for intermediate repeaters enables the gain of a repeater to be determined from either terminal station, and the noise produced by a repeater to be measured from one station without interrupting service. To test for

gain, terminal station A(B) transmits a test signal lying in a 1st(2nd) frequency band not used for traffic. At the repeater this signal is converted by a modulator into a signal lying in a



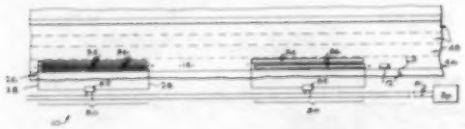
2nd(1st) frequency band, this signal being returned to the A(B) terminal. The repeaters are identified by the frequency of a crystal filter included in the path of the test signals. The circuit can be used with single or double amplifier repeaters.

3,637,956

ELECTRICAL AUTOMOBILE TRANSPORTATION SYSTEM

Robert D. Blackman, 4242 Hazeltine St., Sherman Oaks, Calif.

Filed Jan. 27, 1970, Ser. No. 6,259
Int. Cl. B60l *9/02*; **H02j** *7/00*
U.S. Cl. 191—4 **4 Claims**



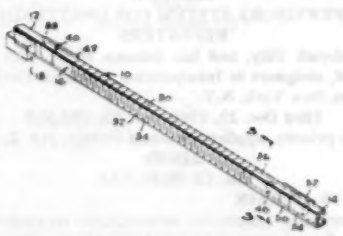
An electrically powered automotive transit system including an automotive vehicle having electrical propulsion means and an electrical power system for supplying electrical energy to the vehicle while on the road. The power system embodies exposed electrified conductors on the road and electrical current collectors on the vehicle for contacting the road conductors to effect transmission of electrical energy from the conductors to the vehicle propulsions means. The electrical energy thus supplied to the vehicle may be utilized periodically to charge a battery in the vehicle which powers the vehicle propulsion motor during normal cruising operation continuously or to power the motor directly during cruising operation.

3,637,957

EXPANSION JOINT

Lester G. Janzow, Los Angeles, and Ronald D. Lipke, Sherman Oaks, both of Calif., assignors to The Dashaveyor Company, Venice, Calif.

Filed Oct. 14, 1968, Ser. No. 767,297
Int. Cl. B60m *1/02, 1/26*
U.S. Cl. 191—29 **6 Claims**



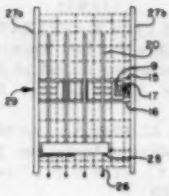
An expandable track section particularly useful for joining sections of an electrical signal or power track. The expandable section comprising a track portion with numerous lateral slots on either side forming a zigzag member.

3,637,958

CAM-OPERATED ELECTRIC TIMING MECHANISM WITH IMPROVED ADJUSTABLE PIN CODING AND RETAINING STRUCTURE

Lester W. Haerther, and Joseph J. Earley, both of Cedar Rapids, Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed Mar. 1, 1971, Ser. No. 119,723
Int. Cl. H01h *7/08, 43/10*
U.S. Cl. 200—38 CA **11 Claims**



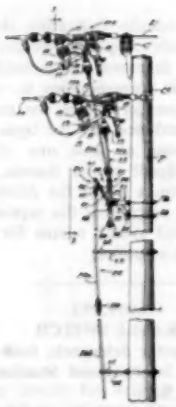
A mechanical memory of the code pin switch activating type employs a plurality of compression loaded code pin members arranged in a containing means which permits lateral translation of each of the pins in a row orientation while constraining the pins from translation transverse the pin row. The pins are substantially square headed and are formed with a head slot which may be selectively oriented so as to be coextensive with or transverse of the pin row axis. Cooperating switch activating members are loaded against the pinheads such that selected pin slot orientations define respective first and second positions of the actuator member.

3,637,959

CIRCUIT DISCONNECT APPARATUS FOR OVERHEAD ELECTRIC LINES

Ronald P. Bridges, c/o Bridges Electric Inc., 2451 Wisconsin St., Downers Grove, Ill.

Filed Oct. 22, 1970, Ser. No. 83,063
Int. Cl. H01h *31/00*; **H02b** *5/02*
U.S. Cl. 200—48 **25 Claims**



Electric circuit disconnect apparatus for an overhead electric line carried on poles, including a line-mounted circuit disconnect means having a disconnect member pivoted on a

horizontal axis to move its free end between an elevated closed position and a lower open position, and a crank and linkage system mounted on a pole for manually operating said disconnect means from ground level. Conveniently three disconnect means on three parallel electric lines are gang operated by a single crank and linkage mechanism.

3,637,960

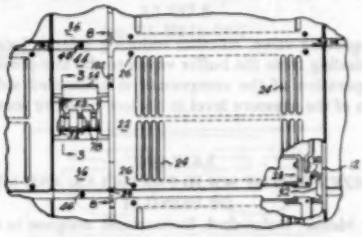
CIRCUIT BREAKER AND SAFETY INTERLOCK FOR MODULAR POWER SUPPLY

Robert G. Plantholt, Rochester, and Michael A. Koltuniak, Warren, both of Mich., assignors to Controlled Power Corporation, Farmington, Mich.

Filed Feb. 6, 1970, Ser. No. 9,179

Int. Cl. H01h *9/22*

U.S. Cl. 200—50 A **15 Claims**



A circuit breaker assembly with a pivotally mounted indicator flag and latch member adapted to engage and releasably lock a manual control handle of the circuit breaker in an open position. The handle in the closed position shields from view the indicator flag and in the open position exposes the indicator flag to view, thereby providing a visual indication of when the circuit breaker is open. An output terminal strip of the circuit breaker has a cover positioned with respect to the handle so that it can be removed only when the handle is in the open position. The circuit breaker is mountable adjacent to a power supply module and mechanically interlocks therewith so that the module cannot be removed from the frame in which it is carried prior to removal of the terminal cover and thus prior to opening of the circuit breaker.

3,637,961

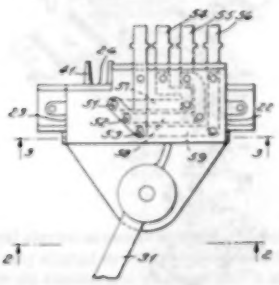
A CONTROL DEVICE FOR ACTUATING A SWITCH AND DIRECTING A FLUID PRESSURE FORCE

Theodore E. Fiddler, 1268 Suffield Drive, Birmingham, Mich., and Arnold G. Adams, Troy, Mich., assignors to said Fiddler, by said Adams

Filed Dec. 2, 1970, Ser. No. 94,283

Int. Cl. H01h *9/06*

U.S. Cl. 200—61.86 **5 Claims**



A control device having one moving body for actuating application of both electromotive force (e.m.f.) and fluid-pressure-force (FPF) in a system such as vehicular heating, ventillating, and/or air-conditioning having a case with a first wall equipped with selectively positioned FPF supply ports and use ports located between supply and use in the system and a second wall equipped with e.m.f. selectively positioned switch arms and contacts located between EMF supply and use in a system; a movable body having a first surface equipped with a grooved maze lying against the ported wall of the case forming a plurality of selective FPF channels relative to the FPF supply and use ports and having a second surface equipped with cam ramps for actuating the EMF switch arms selectively relative to the contacts; and means for selectively moving the body relative to the case to change the maze channels relative to the ports and change the cams relative to the switch arms to selectively and simultaneously control the application of e.m.f. and FPF in the system.

3,637,962

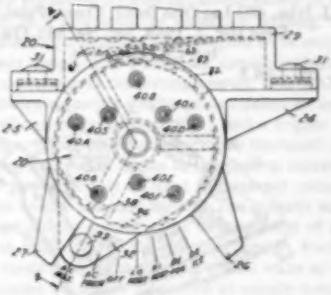
A ROTARY CONTROL DEVICE FOR ACTUATING A SWITCH AND DIRECTING A FLUID PRESSURE FORCE

Theodore E. Fiddler, 1268 Saffield Drive, Birmingham, Mich., and Arnold G. Adams, Troy, Mich., assignors to said Fiddler, by said Adams

Filed Mar. 29, 1971, Ser. No. 128,823

Int. Cl. H01h *9/06*

U.S. Cl. 200—61.86 **2 Claims**



A control device having one moving body or portion for actuating application of both electro-motive force (EMF) and fluid-pressure-force (FPF) in a system such as vehicular heating, ventilating, and/or air-conditioning having a case with a first wall equipped with selectively positioned FPF supply ports and use ports located between supply and use in the system and a second wall equipped with EMF selectively positioned switch arms and contacts located between EMF supply and use in a system; an angularly movable body or portion having a first surface equipped with a grooved maze lying against the ported wall of the case forming a plurality of selective FPF channels relative to the FPF supply and use ports and having a second surface equipped with cam ramps for actuating the EMF switch arms selectively relative to the contacts; and means for selectively angularly moving the body relative to the case to change the maze channels relative to the ports and change the cams relative to the switch arms to selectively and simultaneously control the application of EMF and FPF in the system.

3,637,963

BRAKE WARNING SWITCH WITH BYPASS

Ellis M. Wellman, Erie, Pa., assignor to The Weatherhead Company, Cleveland, Ohio

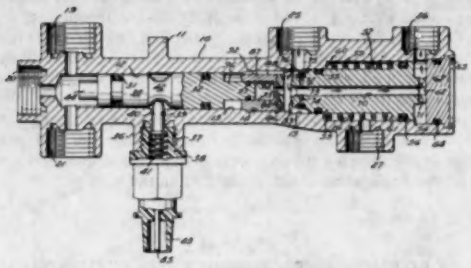
Filed Mar. 2, 1970, Ser. No. 15,457

Int. Cl. H01h *35/38*; **B60t** *13/12*

U.S. Cl. 200—82 D **8 Claims**

A fluid pressure switch is disclosed which includes a switch housing, an axial bore in the switch housing, and a switch piston slidably disposed in the axial bore and arranged to ac-

tuate a switch mechanism and complete an electrical circuit in response to a predetermined pressure differential between the fluid pressures acting on the opposed end faces of the piston. A modulating piston is also disposed in the axial bore for modulating the pressure of fluid flowing from an inlet



passage to an outlet passage. Movement of the switch piston to complete the electrical circuit renders the modulating means inoperable so that the fluid pressure in the fluid inlet passage substantially equals the fluid pressure in the fluid outlet passage.

3,637,964

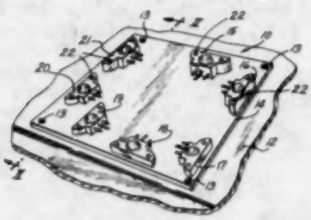
MOTOR VEHICLE CONTROL PANEL

Joseph J. Ivko, 403 Las Olas Drive, Crown Point, Ind.

Filed Dec. 1, 1969, Ser. No. 881,176

Int. Cl. H01h *3/14*

U.S. Cl. 200—86.5 **9 Claims**



A motor vehicle control panel is described which is foot operated. The panel contains a plurality of switching means mounted in strategically disposed relationship to each other to permit the selective operation of one of said switching means while preventing the inadvertant operation of another of said switching means. The switches are each connected to a different safety accessory of said vehicle to selectively control the operation thereof. The panel is especially useful to allow individuals having impairment or dismemberment of one or both arms to safely operate a motor vehicle.

3,637,965

ELECTRICAL SWITCH UTILIZING COMPRESSED GAS FOR ARC EXTINCTION

Wolfgang Schmitz, Birkenau, Germany, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

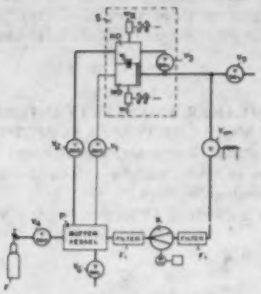
Filed Mar. 19, 1970, Ser. No. 21,021

Claims priority, application Germany, Apr. 1, 1969, P 19 16 560.7

Int. Cl. H01h *33/80*

U.S. Cl. 200—148 E **5 Claims**

An electrical switch structure utilizing a compressed gas such as SF_6 for arc extinction comprises a high-pressure section, a low-pressure section and a switching point controlled by a blast valve located intermediate the high- and low-pressure sections. The gas flows in a closed circuit from the high-pressure section through the switch contacts to the low-pressure section, thence to a compressor which recompresses the gas and thence back to the high-pressure section. Included in the gas circuit between the compressor outlet and the high-pressure section is a buffer vessel which operates at a pressure higher than that of the high-pressure section, and the necessary pressure reduction is attained by means of an inter-



posed reducing valve. Another reducing valve is located in a line extending from the buffer vessel to the low-pressure section. Operation of the compressor is controlled solely as a function of the pressure level in the low-pressure section.

3,637,966

FLUIDIZED BED OF SOLID PARTICLES, AND METHOD OF USING IT

Werner Moller, Dubendorf, Switzerland, assignor to Oerlikon Engineering Company

Filed May 3, 1968, Ser. No. 726,598

Claims priority, application Switzerland, May 12, 1967, 6816/67

Int. Cl. H01h *33/22*

U.S. Cl. 200—148 G **4 Claims**

Fluidized bed comprises discrete particles of alumina trihydrate, and a gas such as air or sulfur hexafluoride is directed through particles to fluidize them. Fluidized bed may be used as a cooling medium for electrical apparatus, such as transformers, and as a medium to assist in extinguishing the arc between switch contacts.

3,637,967

SWITCH OF THE REVERSING-TYPE

Hermann E. Braun, Chicago, Ill., assignor to Skil Corporation, Chicago, Ill.

Continuation of application Ser. No. 748,271, July 29, 1968, now abandoned. This application June 26, 1970, Ser. No. 56,074

Int. Cl. H01h *21/30, 21/10, 23/12*

U.S. Cl. 200—155 R **14 Claims**

The switch includes a base or block mounting first and second pairs of fixed contacts, with each of these contacts

having a portion thereof adjacent the wall of a bore formed in the base centrally thereof. A cylinder is rotatably received in this bore, the cylinder carrying first and second movable contacts. An actuating arm is provided to move the cylinder back and forth between a first position wherein the first and second movable contacts respectively connect the contacts of the first and second pairs of fixed contacts with each other and a second position wherein the first and second movable contacts respectively connect different ones of the first pair of contacts with the contacts of the second pair of contacts.

3,637,968

HOLDING ARRANGEMENT FOR REED CONTACTS

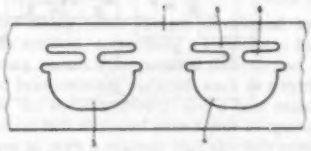
Werner Knigge, Wolfach/Schw., Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 5, 1970, Ser. No. 16,671

Claims priority, application Germany, Mar. 11, 1969, P 19 12 297.5

Int. Cl. H01h *9/02*

U.S. Cl. 200—168 R **4 Claims**



This device relates to a holding arrangement for reed contacts in a plastic body provided with oblong hole-shaped recesses into the upper half of which each time two oppositely directed flexible remaining portions project, of which respectively one is cut off.

3,637,969

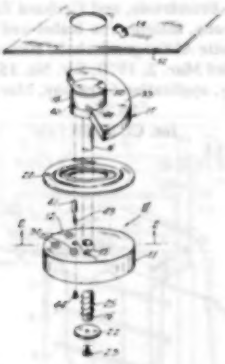
FLUID METAL ELECTRICAL SWITCH

Walter R. Vignini, Peekskill, N.Y., assignor to Sonotone Corporation, Elmsford, N.Y.

Filed Nov. 13, 1970, Ser. No. 89,310

Int. Cl. H01h *29/00*

U.S. Cl. 200—203 **5 Claims**



A fluid metal electrical switch wherein the volume of fluid metal, which may engage or bridge complementary contacts, is confined in an elastomeric channel and a cam engaging and compressing the channel is provided with a recess defining the volume of fluid metal. Movement of the cam thereby moves the body of fluid metal to selected contact positions. The position of the fluid metal contact is therefore independent of position, orientation or acceleration of the device in which the switch is mounted.

3,637,970

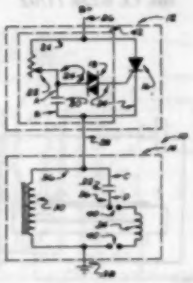
INDUCTION HEATING APPARATUS

Ronald J. Cunningham, 4360 Eagle Rock View Drive, Los Angeles, Calif.

Filed July 6, 1970, Ser. No. 52,186

Int. Cl. H05b *5/00*

U.S. Cl. 219—10.75 **13 Claims**



A circuit for supplying a series of current pulses to an output coil, such as a coil used for induction heating, can be constructed utilizing a timing circuit adapted to be connected to a DC power supply and a resonant circuit including the output coil connected to the timing circuit. The timing circuit used includes a current discharge or release means such as an SCR (silicon-controlled rectifier) and a trigger means such as a trigger diode (bidirectional diode thyristor) for actuating or firing the release means in response to current supplied by the power supply so that the release means will supply current to the resonant circuit. The current supplied to the resonant circuit results in the development of a resonant current in opposition to the supplied current. Such resonant current feeds back to the timing circuit so as to render the release means no longer operative to supply current to the resonant circuit until such time as thereafter the trigger means, as a result of power supplied to it from the power supply, actuates the release means so that it will again supply current to the resonant circuit.

3,637,971

FLASH WELDING PROCESSES

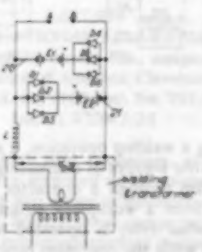
James C. Needham, Saffron Walden; Keith I. Johnson, and John A. Wright, both of Cambridge, all of England, assignors to The Welding Institute, Cambridge, England

Filed June 8, 1970, Ser. No. 44,170

Claims priority, application Great Britain, June 10, 1969, 29,403/69

Int. Cl. B23k *9/10, 11/04*

U.S. Cl. 219—97 **2 Claims**



The invention relates to flash welding processes, and stems from the discovery that craters in the plane of the weld are

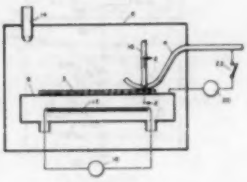
due to the formation of unexpectedly large arcs. A voltage-limiting circuit is connected across the gap between the two workpieces being welded, and is arranged so that arcing at voltages above a predetermined level is suppressed, but arcing at lower voltages is permitted.

3,637,972

METHOD AND APPARATUS FOR FORMING AN OHMIC CONTACT TO HIGH-RESISTIVITY SILICON

Arno K. Hagenlocher, Melville, N.Y., assignor to GTE Laboratories Incorporated

Filed Apr. 1, 1970, Ser. No. 24,489
Int. Cl. B23k *11/02*
U.S. Cl. 219—107 6 Claims



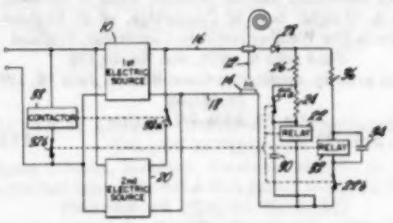
A method of forming an ohmic contact between a conductor and a silicon substrate having a resistivity greater than 5 ohm-cm. by etching the substrate, heating it in an atmosphere of inert gas, pressing the conductor into contact with the substrate, and allowing sufficient current to flow through the conductor and the substrate to form the contact.

3,637,973

ARC WELDING APPARATUS

Jun Ukai, and Masaki Hiramatu, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1970, Ser. No. 12,094
Claims priority, application Japan, Feb. 19, 1969, 44/12392
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 R 5 Claims



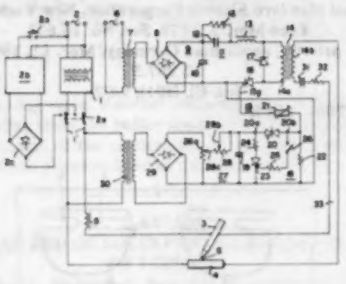
Upon initiating a welding operation, a relay is operated to connect two electric sources of alternating current in parallel circuit relationship through a contactor to fuse a welding electrode away from a workpiece striking an arc between them. Then another relay is operated to keep one of the sources disabled while the operation proceeds with the other source. Upon short circuiting, the contactor is operated to repeat the above process.

3,637,974

SWITCHING ARRANGEMENT FOR THE STABILIZATION AND IGNITION OF WELDING ARCS AND THE LIKE

Franz Tajbl, Pullach, and Max Gilitzer, Munich, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Continuation-in-part of application Ser. No. 741,065, June 28, 1968, now Patent No. 3,551,741. This application May 13, 1970, Ser. No. 36,809
Claims priority, application Germany, June 6, 1969, P 19 28 757.1
Int. Cl. B23k *9/10*
U.S. Cl. 219—135 19 Claims



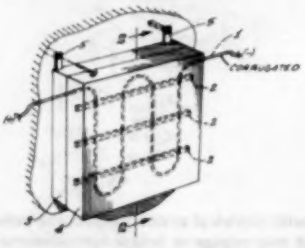
A switching system for the stabilization of alternating-current welding arcs and for the ignition of alternating-current or direct-current welding arcs in which the ignition or stabilization current pulse between electrode and workpiece or between two electrodes is transmitted through a capacitor and at least one semiconductive controlled rectifier (SCR or thyristor) is provided in the discharging circuit of the capacitor. The gate of the controlled rectifier is triggered by a control circuit synchronized with the current source and including a voltage-responsive switching element in circuit with a control capacitor. The voltage-responsive switching element is a DIAC-type trigger diode whose output is connected directly i.e., via only ohmic impedance) with the control electrode or gate of the controlled rectifier.

3,637,975

AREAL HEATING ELEMENT

Bernd Eilhardt, Brandriede, and Gerhard Ziemek, Hannover, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Mar. 2, 1970, Ser. No. 15,812
Claims priority, application Germany, Mar. 14, 1969, G 69 10 254.1
Int. Cl. H05b *1/00*
U.S. Cl. 219—213 2 Claims



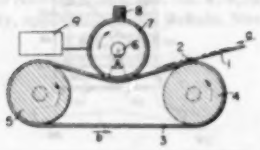
An areal heating element, having a polyurethane backing member with an embedding and sealing layer thereon in which is embedded a meandering heating conductor.

3,637,976

FIXING DEVICE OF TONER IMAGES

Wasaburo Ohta, Yokohama, and Kazuhiko Kasuya, Kawasaki, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed June 15, 1970, Ser. No. 46,371
Claims priority, application Japan, June 14, 1969, 44/47203
Int. Cl. G03g *13/20*
U.S. Cl. 219—216 9 Claims



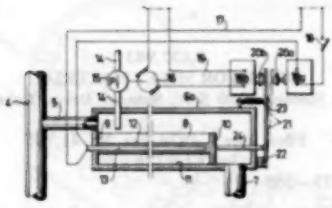
Device for fixing toner images developed by a powder development method, comprising a cylindrical heating roller having heating means incorporated therein and a nonadhesive layer of heat-resistant material, such as a synthetic resin, applied over the surface thereof; and a heat resisting and insulating endless belt wrapped over a pair of spaced drive and driven rollers in such a manner that the belt contacts an extended part of the periphery of the rotating heating roller, so that when a recording medium bearing thereupon a toner image is conveyed by the belt and makes contact with the heated peripheral surface of the heating roller, the toner is heated and fused to the recording medium during passage over the entire extended part of the periphery. The heating roller may further include preheating means and fixing at high speed may be attained.

3,637,977

VAPORIZER FOR DISINFECTION CHAMBERS

Carl Tage Evert Folke, Hagersten, Sweden, assignor to AB Vibrasug, Johanneshov, Sweden

Filed Apr. 8, 1970, Ser. No. 26,601
Claims priority, application Sweden, Apr. 9, 1969, 5003/69
Int. Cl. H05b *1/02*
U.S. Cl. 219—272 7 Claims



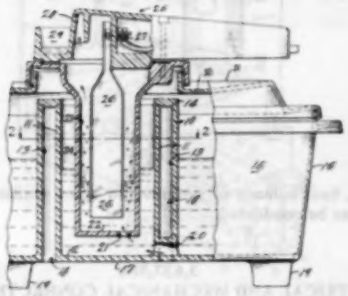
This invention relates to means for vaporizing disinfection liquid such as formation by mixing air with said liquid or vapor therefrom. Said vaporizing means comprises a feedback air conduit defining an elongate vaporizing channel secured at one end to a vaporizing chamber and being free to expand at its opposite free end as a result of electrical heating of said channel so as to actuate electric switch means for breaking and closing the electric heating current, respectively, at a predetermined temperature of said channel.

3,637,978

ELECTRIC STEAM VAPORIZER

William H. Corbett; Albert D. Brunell, and George A. Koharchik, all of Somerset, Pa., assignors to Champion Spark Plug Company, Toledo, Ohio

Filed June 30, 1970, Ser. No. 51,158
Int. Cl. H05b *3/60*; A61m *15/00*
U.S. Cl. 219—284 4 Claims



The invention is an electric steam vaporizer having an insulating chamber open to atmosphere. One embodiment includes a water receptacle insulated against heat transfer from a boiling chamber by relatively cooler liquid in a housing and by an open-bottomed air-filled insulating chamber in contact with outside atmosphere adjacent said housing and said receptacle. The boiling chamber has a cover, a continuous sidewall and a base wall with a fluid passage. The chamber is mounted within the housing. The housing has an impervious inner wall, a bottom wall, and an impervious outer skirt spaced at a substantial distance from the inner wall by an impervious top wall. An air-filled insulating chamber, defined by the inner wall, the outer skirt, and the top wall, is in contact with outside atmosphere through an opening in the water receptacle. Fluid flows from the receptacle through a restricted supply port into the chamber housing and from there through the fluid passage into the boiling chamber where it is vaporized by two spaced-apart electrodes. The vapor passes through a steam discharge port in the cover, over a liquid medicant well portion and into atmosphere. The second embodiment is of a safe electric steam vaporizer identical to the first embodiment except that the open-to-atmosphere, air-filled insulating chamber in contact with outside atmosphere is contiguous with the boiling chamber and the water receptacle.

3,637,979

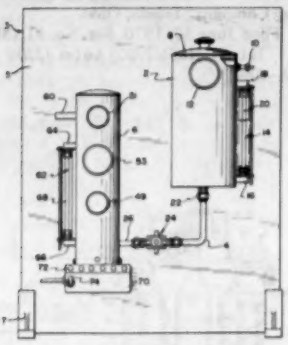
EDUCATIONAL APPARATUS

Karl Moeglich, Deerfield Beach, Fla., assignor to Automatic Sprinkler Corporation of America, Cleveland, Ohio

Filed Jan. 16, 1969, Ser. No. 791,571
Int. Cl. F22b *1/28*
U.S. Cl. 219—271 9 Claims

An educational phase heat exchanger, primarily a functional device, which is arranged as an educational aid. The apparatus consists of two major components: a boiler and a liquid-feed reservoir. Both of these components are ordinarily constructed of a corrosion-resistant material and can be used for the production of wet or dry steam and for the production of wet or super-heated vapors from primary alcohols or mixed liquids of various viscosities. By attaching

thermocouples at predetermined points in the system, studies of heat transfer through component walls, enthalpies of vapors, heat balance of systems and other similar investigations can be conducted.

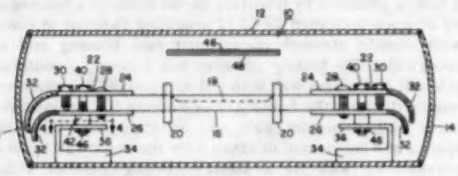


3,637,980

ELECTRICAL AND MECHANICAL CONNECTIONS AND SUPPORT FOR EVAPORATING BOATS

Philip J. Fox, and John W. Wright, both of Scottsdale, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed July 13, 1970, Ser. No. 54,135
Int. Cl. C23c *13/12*
U.S. Cl. 219—271 **2 Claims**



Evaporating boats which are heated by passing electrical current therethrough are made of material which exhibits high resistance and is refractory. Such material is very brittle. Nonarcing means are provided to connect the electrical supply to the boat and at the same time to permit the boat to expand and contract as it is heated and cooled without so confining the boat or so bending the boat as to cause breakage thereof. The nonarcing means includes tight electrical connections to the ends of the boat and the support means for the electrical connections permit linear motion thereof.

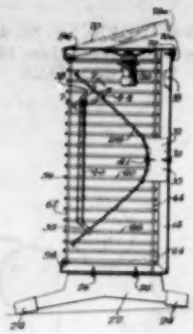
3,637,981

ELECTRIC SPACE HEATER

James A. Swimmer, Highland Park, Ill., assignor to Berns Air King Corporation

Filed Apr. 6, 1970, Ser. No. 25,780
Int. Cl. H05b *3/06*
U.S. Cl. 219—347 **8 Claims**

An electric space heater having a sinusoidal heating element connected to mirror image portions of a reflector formed of sheet metal and having a substantially uniform parabolic cross-sectional configuration throughout its length. The central portion of the reflector is connected to the space heater housing while the top and bottom mirror image portions of the reflector are free to flex in response to heating of the heating element. The space heater includes a protective grill positioned in front of the heating element, which grill is rigidly secured to a base portion and top cover member of the space heater without the use of external fastening means.

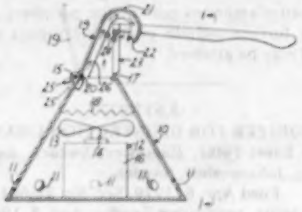


3,637,982

APPARATUS FOR HEATING THERMOPLASTIC FRAMES FOR GLASSES

John E. Reaves, 1029 Christine Ave., Anniston, Ala.

Filed July 16, 1970, Ser. No. 55,390
Int. Cl. F24h *3/04*
U.S. Cl. 219—368 **6 Claims**



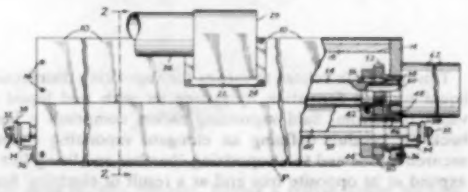
Heating apparatus for thermoplastic frame for glasses where heated air is discharged from a housing and directed by an arcuate baffle around specific portion of frame. Air supplied by blower which forces air past heat element in housing.

3,637,983

DRIER FOR SHEET MATERIAL

Victor R. Nelson, 2700 S.W. Summit Drive, Lake Oswego, Oreg.

Filed June 1, 1970, Ser. No. 41,785
Int. Cl. F27b *9/06*
U.S. Cl. 219—388 **4 Claims**



An elongated suction hood has an open side adapted to face continuously moving sheet material to be dried by one

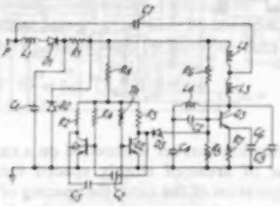
or more elongated electrical heaters disposed in the hood. An elongated combination reflector and shield is mounted in the hood for rotational adjustment about each heater between a reflecting position on the side of the heater opposite the open side of the hood and a shielding position interposed between the heater and open side of the hood.

3,637,984

TEMPERATURE CONTROL APPARATUS

John Anderson Irvine, Penicuik, Midlothian, Scotland, assignor to Molins Machine Company Limited, London, England

Filed Nov. 25, 1969, Ser. No. 879,705
Claims priority, application Great Britain, Nov. 27, 1968, 56,373/68
Int. Cl. H05b *1/02*
U.S. Cl. 219—471 **12 Claims**



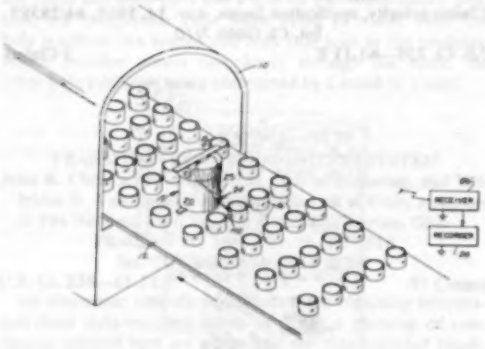
A rotatable drum has a heating element which is supplied with heating current through sliprings and brushes, a temperature sensor being located in the drum and coupled to an oscillator to modulate the pulse width or frequency of the generated oscillations in accordance with temperature, the modulated oscillations being fed outside the drum through the same sliprings and brushes to a controller to regulate the heating current.

3,637,985

PORTABLE REMOTE LOCATION MEASURING SYSTEM

David S. Stacey, Carbondale, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jan. 21, 1969, Ser. No. 792,395
Int. Cl. H05b *1/02*
U.S. Cl. 219—490 **9 Claims**



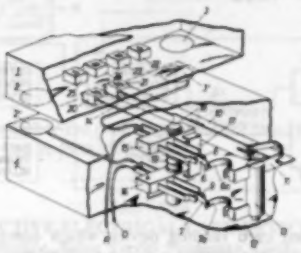
A portable system for measuring a condition, particularly temperature, and indicating this measurement at a remote location. A portable insulating and protective container adapted for use in extreme temperature environments, such as occasioned within a furnace or oven, houses a small transmitter. The transmitter is connected to a transducer responsive to the condition to produce a signal that is transmitted to a remote receiving and monitoring location.

3,637,986

ELECTRICAL UNIT HAVING A MAGNETIC SWITCH CONNECTING A CORDLESS ELECTRIC POWER APPLIANCE TO A CHARGING APPLIANCE

Kikolaus Laing, Hofener Weg 35-37, 7141 Aldingen Bei Stuttgart, Germany

Filed Jan. 27, 1970, Ser. No. 6,269
Claims priority, application Austria, Feb. 3, 1969, A 1070/69
Int. Cl. H05b *1/02*
U.S. Cl. 219—519 **6 Claims**



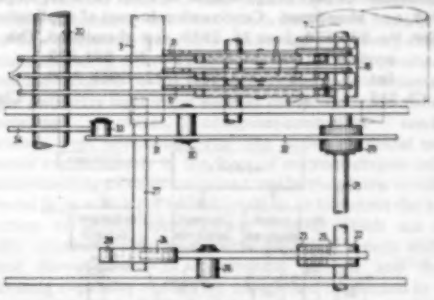
An electrical unit having a connecting means for a cordless electric power appliance whose terminals are brought into contact with the corresponding terminals of a charging appliance, having a magnetically operated electric switch whose switching mechanism has a magnetic arrangement on which a magnetic force closing the switch contacts is exerted by a further magnetic arrangement located in the electric appliance.

3,637,987

ZERO-PRINTING DEVICE FOR CALCULATING MACHINES

Werner Rauch, Nurnberg, Germany, assignor to Diehl, Nurnberg, Germany

Filed June 3, 1970, Ser. No. 42,935
Claims priority, application Germany, June 4, 1969, P 19 28 396.6
Int. Cl. G06c *19/00, 19/04*
U.S. Cl. 235—60.28 **5 Claims**



The specification discloses a printing-type calculating machine having movable-type carriers coupled to the value transfer racks of the machine. A feeler member in the machine feels the racks when advanced into value positions prior to the printing and operates a stop device which prevents the printing of digits leftwardly of the highest valued

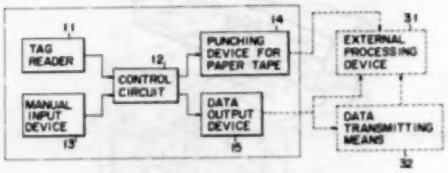
rack, which is advanced from the zero position thereof. The machine also comprises a device adjusted in conformity with the selection of the decimal point position for controlling the stop device so that at least all of the carriers positioned rightwardly of the decimal point position will print regardless of the position of the respective value transfer racks.

3,637,988

PUNCHED CARD READING SYSTEM

Sakae Yanagawa, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 8, 1970, Ser. No. 26,740
Claims priority, application Japan, Apr. 14, 1969, 44/28386
Int. Cl. G06k *17/00*
U.S. Cl. 235—61.6 J **3 Claims**



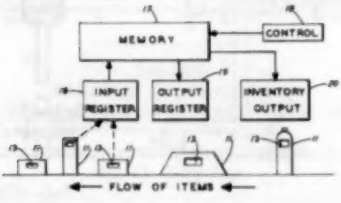
A punched card reading device which comprises a tag-reading device for reading a tag cut off from a commercial article including a selector for selecting an error tag from normal tags and a keyboard for entering the data of a tag unadapted to be read out, a control circuit for performing the parity, validity and order count check readout of the tag, a selector circuit actuated when there is detected the erroneous reading of the tag, a control switch for stopping, where the tag is found to travel in an abnormal condition, the operation of the reading device so as to eliminate such abnormalities, and transforming circuitry, if necessary, for transforming readout signals representing the data recorded in the tag or supplied by the hand-feed device; a paper tape punching device for punching a paper tape according to the data signals drawn out of the control circuit; and an output device for supplying the data drawn out of the control circuit to an external processing device in an online connection.

3,637,989

AUTOMATIC PRICING AND INVENTORY CONTROL APPARATUS

Joseph D. Howard, 657 Blair Ave., Piedmont, Calif., and William M. Brobeck, Orinda, Calif., assignors to said Joseph D. Howard, by said Brobeck

Continuation-in-part of application Ser. No. 749,815, Aug. 2, 1968, now abandoned , Continuation-in-part of application Ser. No. 820,670, June 16, 1959, now abandoned. This application July 14, 1969, Ser. No. 841,209
Int. Cl. G06k *7/14*; **G06m** *1/22*; **G06k** *3/00*
U.S. Cl. 235—61.7 R **1 Claim**



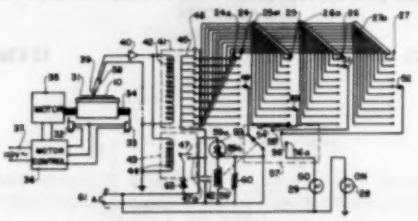
This relates to an apparatus for indicating the price and amount on hand of any specific item of a number of items in a warehouse or store. Every item has a code marking with identical items carrying identical code markings. A memory unit is provided in the apparatus, with space for every coded marking in stock. Associated with the space of each such marking in the memory is a price and an inventory counter, so that, as each coded marking on a particular item is registered, the associated price is displayed, as well as, the new inventory count of the item.

3,637,990

CREDIT CARD VALIDATOR WITH TRANSDUCER-READOUT

Jack E. Bayha, 11753 Sperry Road, Chesterland, Ohio, and John W. Dixon, 9886 Fairmount Road, Newbury, Ohio

Filed Oct. 31, 1969, Ser. No. 873,029
Int. Cl. G06k *5/00*; **H04q** *3/00*
U.S. Cl. 235—61.7 B **6 Claims**



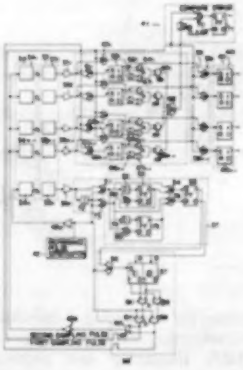
An identification number is encoded on a card in the form of a number of areas of closely spaced variations in the planar configuration of the card, the spacing of the variations in a particular area being determined by the digit encoded on that region. The encoded number is read by a device which moves the card at a uniform speed with the variation bearing areas in contact with an electromechanical transducer. As each area passes the transducer a tone, whose frequency is determined by the spacing of the variations of the area and, therefore, identified with the digit encoded in that area, is produced, amplified, and then drives the coil of a resonant-reed relay. The contact of the relay which has a resonant period equal to the generated frequency and corresponding to the encoded digit closes. The reading device compares the number determined by the relay with one manually supplied to it and indicates the identity or nonidentity of the two numbers.

3,637,991

PHOTOELECTRIC READOUT APPARATUS

Sakae Yanagawa, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 9, 1970, Ser. No. 27,026
Claims priority, application Japan, Apr. 14, 1969, 44/28387
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.11 E **5 Claims**



A photoelectric readout apparatus to photoelectrically read out punched data in a medium such as paper tape hav-

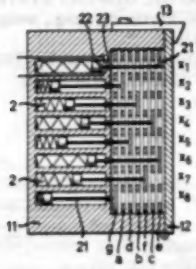
ing a column of sprocket holes, comprising means to produce sprocket hole detection signals by forming the initiation of a sprocket hole detection signal when two successive pulses from a light-receiving element to receive light flux from an illuminating element corresponding to the sprocket hole are detected and by forming the termination of the sprocket hole detection signal when two successive pulses from the light-receiving element are missed, means to sample data twice by rendering illuminating elements corresponding to data holes twice in succession during the presence of the sprocket hole detection signal, and means to check whether the data contents in the first and second samplings are identical or not.

3,637,992

METHOD AND APPARATUS FOR CHECKING THE PRESENCE OF A SET OF INFORMATION-BEARING CARDS

Ferdinand Ruesch, St. Gall, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed July 2, 1970, Ser. No. 51,953
Claims priority, application Switzerland, July 8, 1969, 10515/69
Int. Cl. G06k *5/00*
U.S. Cl. 235—61.11 R **8 Claims**



A method and apparatus is disclosed for checking the presence of all the cards of a set of punched cards required for a program of a data processing apparatus, the cards each bearing a different code word and the cards being stacked so that all the code words combine to produce a completion code word indicating that all the cards are present. The code words are each represented by holes and one blank space in the cards and each card has a hole in a predetermined position, the completion code word being provided when the hole positions are sensed and only that hole in the predetermined position passes completely through the stack, the other hole positions being obstructed by a blank in a card.

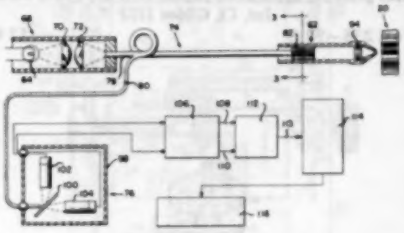
3,637,993

TRANSITION CODE RECOGNITION SYSTEM

John B. Christie; Dzintars Abuls, both of Kettering, and Wilfridus G. Van Breukelen, Centerville, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed June 30, 1969, Ser. No. 837,514
Int. Cl. G06k *7/10;* **G01n** *21/30*
U.S. Cl. 235—61.11 E **37 Claims**

An electronic identification system for obtaining information from data-encoded labels in which a plurality of contiguous colored bars are printed on the data-encoded labels, each colored bar being of a color different from the color of its neighboring colored bars, is disclosed. The data-encoded label is scanned by a probe which images a spot of light on the label and which receives, from the label, reflected light signals that are supplied to the identification system. The identification system is constructed to receive and to decode a predetermined number of data bits according to a "size code" that is contained on the label, to perform a parity check of the data bits that are encoded on the label, and to transmit the decoded data to a data utilization device regardless of whether the probe traversed the label in a forward direction or in a reverse direction.

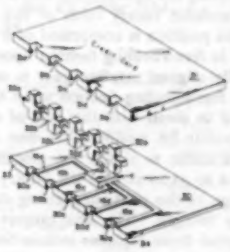


3,637,994

ACTIVE ELECTRICAL CARD DEVICE

Jules K. Ellingboe, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 678,607, Oct. 29, 1967, abandoned
Filed Oct. 19, 1970, Ser. No. 82,202
Int. Cl. G06k *19/00;* **H03k** *23/22*
U.S. Cl. 235—61.12 N **5 Claims**



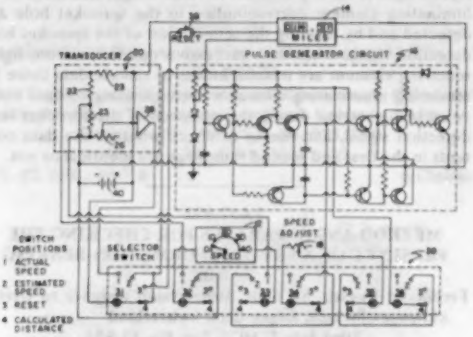
This invention relates to data-processing and information-handling equipment, and more particularly, to a card of the type now commonly used as a credit card but having therein circuits including active electrical components connected to terminals adapted to be mated detachably to contacts in larger stationary equipment such as computer input devices, accounting machines, computer-controlled vending machines, coin telephones, etc. The active electrical components are preferably in the form of microelectronic information-handling circuits contained inside the plastic or other material from which the card is made so as to permit the construction of unique identification systems which are not readily counterfeitable by external analytical means and to permit the inclusion of information storage and data-processing capability so that the card, when connected to the apparatus by the individual user, becomes an integral part thereof and upon inquiry from the apparatus can respond with the user's identity, account status, current purchase request, and the like. The card is intended for use as a "key card" and for use in automatic verification of identity, accounting, posting, billing, and transfer of funds in order to reduce either the amount of cash which the user is required to carry or the number of checks or other banking or billing transactions which must be manually carried out.

3,637,995
AGGREGATE MOTION MECHANISM
Kaoru Segawa, Tokyo-to, Japan, assignor to Nippon Electric Company, Limited, Minato-ku, Tokyo, Japan
Filed Oct. 19, 1970, Ser. No. 81,800
Claims priority, application Japan, Oct. 25, 1969, 44/85359
Int. Cl. G06m 1/22
U.S. Cl. 235—92 C 12 Claims

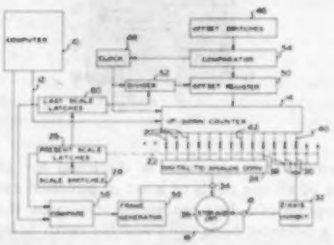
An aggregate motion mechanism capable of receiving information, preferably in binary form, presented in either serial or parallel fashion for accumulating or adding the information and converting the information into a visually observable output. In a multibit binary form of the aggregate motion device, each bit position is comprised of a pair of gear members mounted in freewheeling fashion upon a common shaft. A third radially aligned satellite gear is secured to a collar mounted in a freewheeling fashion upon the common shaft, and is adapted to mesh with the pair of cooperating gears. The next adjacent bit position has one of its bevel gears secured to the collar to which the aforementioned satellite gear is secured so as to couple the binary input information from each stage to the next succeeding stage in accordance with its binary "weight." The final output stage may be provided with a print drum or other indicia-bearing drum for the purpose of either printing out or visually displaying a character or other symbol representative of the binary information impressed upon the aggregate motion mechanism enabling its use as either a converter or selector device for converting binary information into alpha-numeric form or for selecting a particular symbol for display or printout or may, alternatively, be employed as an adder or accumulator device in which binary data may be accumulated.

3,637,996
NAVIGATIONAL DISTANCE COMPUTER
Malcolm Seymour, South Bristol, Maine, assignor to Prototypes, Inc., South Bristol, Maine
Filed Oct. 20, 1969, Ser. No. 867,772
Int. Cl. H03k 21/00
U.S. Cl. 235—92 FQ 2 Claims

A manually presettable speed, continuously indicating, computed distance navigational computer for vessels comprising an electrical preset speed display meter, an electromechanical digital computed mileage indicator, a pulse generator for operating the mileage indicator to provide a continuous digital display of computed distance travelled at a preset rate with the passage of time and a manually adjustable electrical resistor common to the pulse generator and meter for establishing the pulse generator frequency and operating the meter to display the estimated preset speed needed to product the computed distance travelled with time at said preset speed for setting a desired speed into the computer. Actual speed through the water may also be displayed on the meter.



3,637,997
GRAPHIC DISPLAY SYSTEM
Walter A. Petersen, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Dec. 6, 1968, Ser. No. 781,777
Int. Cl. H03k 23/20
U.S. Cl. 235—92 N 38 Claims

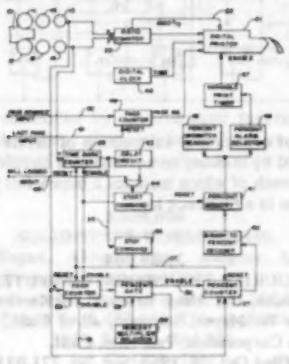


Incremental plotting instructions are received from a computer for bringing about a point-plotting display on a cathode-ray tube. Plotting inputs increment a counter means for accumulating a total representing cathode-ray tube deflection, with the cathode-ray tube being coupled to the counter means via a digital-to-analog converter means. Inputs to the digital-to-analog converter means are positionable relative to the counter stages for changing the scale of the display. Also, a write-through frame is positionable relative to a stored image for selecting a portion of a given display for subsequent presentation. The offset position of the frame is stored in an offset register by means of a digital servomechanism system. A function of the complement of the offset is added to the aforementioned counter means for offsetting a subsequent display.

3,637,998
SPEED RATIO MEASURING SYSTEM
Robert A. Sylvester, Coraopolis, and Ronald W. Young, Beaver, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Filed Mar. 26, 1969, Ser. No. 810,655
Int. Cl. B21c 51/00
U.S. Cl. 235—92 DN 3 Claims

A ratio counter provides a measure of the speed ratio of a cooperative pair of work rolls on a reversing roughing mill by

counting a preset number of pulses generated by a first pulse tachometer attached to the motor drive shaft of one of the rolls and the number of pulses generated during the same period of time by a second pulse tachometer attached to the motor drive shaft of the other work roll. The output of the ratio counter is applied to the input of a digital printer. The ratio counter supplies the printer with a print command after each ratio measurement, but the printer remains inert until activated by an alarm system. The alarm system functions to activate the printer only when the roll speed ratio falls outside a predetermined range. The alarm system includes a first counter means for counting up to the same preset number of pulses from the first tachometer as does the ratio counter and a second counter means for counting a preselected number



of pulses from the second pulse tachometer which number is less than that preset number of pulses. The system also includes a third counter means for counting the number of pulses generated by the second pulse tachometer between the time the second counter reaches said preselected number of pulses and the first counter reaches said preset number of pulses. Means are provided for developing in response to the count present in the third counter at the time the first counter reaches said preset number of pulses an output constituting a representative measure of the ratio of the number of pulses generated by the first pulse tachometer to the number of pulses generated by the second pulse tachometer during the period the first counter is counting up to the preset number; and when that output is outside a predetermined range, the printer is activated.

3,637,999

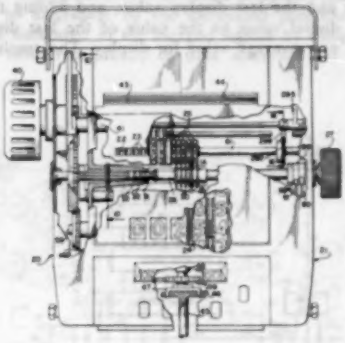
VARIABLE RATE COMPUTING AND RECORDING REGISTER

Michael Pappas, Irvington, N.J., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed May 25, 1970, Ser. No. 40,003
Int. Cl. B67d *5/22*
U.S. Cl. 235—94 A **23 Claims**

A computing and recording register wherein integrating digital counters are driven by an input shaft to perform quantity, price and tax computations. The price and tax counters are driven by computer gearing coupled to the quantity counter drive gearing through a clutch. A two-stage advance mechanism rounds off the least significant digit of each of the counters and aligns the digits for printing quantity, price and tax data on a recording sheet at the conclusion of each transaction to be recorded. During the first stage, the quantity counter is advanced to align the digits while the clutch is engaged so that the price and tax counters are driven as the quantity counter advances. During the second stage, the clutch is disengaged and the price and tax counters advance independently of the quantity counter.

Also included are a plurality of variable ratio gear trains adjustable through a translatable and rotatable selector shaft



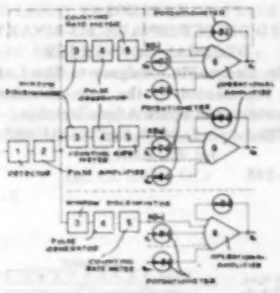
for changing one or more of the gear ratios to select the desired tax rate and price per quantity unit.

3,638,000

METHOD AND APPARATUS FOR CONTINUOUSLY DETERMINING THE QUANTITIES OF THE QUALITATIVELY KNOWN RADIOACTIVE NUCLIDES CONTAINED IN A PHYSICAL SYSTEM

Gianfranco Franco; Carlo Mancini, and Angiolo Pulacci, all of Rome, Italy, assignors to Comitato Nazionale per l'Energia Nucleare, Rome, Italy

Filed Oct. 3, 1967, Ser. No. 672,539
Claims priority, application Italy, Oct. 7, 1966, 787056
Int. Cl. G06g *7/34*
U.S. Cl. 235—151.35 **3 Claims**



A computer of the analog-type adapted for the solution of a system of n linear equations with n unknown quantities is associated with a multichannel analyzer (particularly an analyzer with n channels) the output of which represents the counting rates related to n energy levels E_a suitably chosen from the resultant spectrum of the n nuclides N_a.

3,638,001

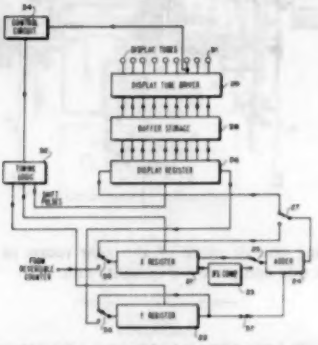
METHOD AND APPARATUS FOR AVERAGING THE DIGITAL DISPLAY FOR A FLUCTUATING DIGITAL MEASUREMENT AND IMPROVING THE RESOLUTION OF THE MEASUREMENT

Gary B. Gordon, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 4, 1970, Ser. No. 16,301
Int. Cl. G01r *23/02*; **G01b** *9/02*
U.S. Cl. 235—152 **19 Claims**

A digital display system in which fluctuations in the last one or two numbers of a repetitive display value are removed

by an averaging technique comprising the steps of determining the difference between the new incoming digital value and the last digital display value, taking a certain preselected percentage such as one percent of the difference between the new value and the last display value, and adding the new computed digital value to the value of the last display to produce a new average value for display. The resolution of



the incoming digital values is increased by a statistical interpolation process whereby, in averaging over a large number of quantized incoming values, the resolution of the displayed values exceeds that of the quantization-limited input. This technique, as well as an alternate averaging system, is employed to reduce the jitter and enhance the resolution of the digital display of a distance measuring interferometer.

3,638,002

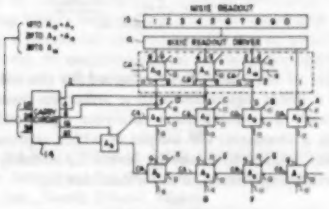
HIGH-SPEED DIRECT BINARY-TO-BINARY CODED DECIMAL CONVERTER

Pierce C. Toole, Cocoa, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Apr. 3, 1970, Ser. No. 25,487

Int. Cl. H04l *3/00*

U.S. Cl. 235—155 **8 Claims**



A high-speed binary-to-binary coded decimal converter which includes a plurality of decades connected in cascade. Interposed between each of said decades is a carry circuit. The carry circuit supplies carry numbers to the succeeding decade, plus it sends a corrector number back to a corrector circuit associated with the preceding decade. This corrector number is combined with binary numbers already stored in the corrector circuit to produce a proper signal on a readout device associated therewith.

3,638,003

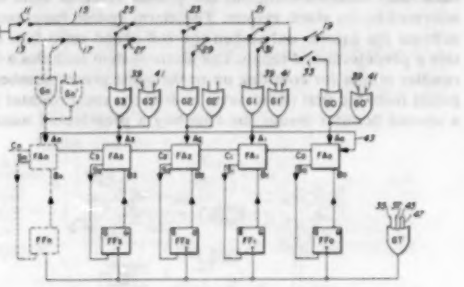
CREDIT-ACCUMULATING ARRANGEMENT

Edwin J. Meixner, Mount Prospect, Ill., assignor to Walter E. Heller & Company, Chicago, Ill.

Filed Sept. 12, 1968, Ser. No. 759,407

Int. Cl. G06f *7/385*

U.S. Cl. 235—175 **22 Claims**



Addition of credits and subtraction of debits is electronically achieved by utilizing an accumulator circuit having multiple stages, each of which includes a binary full adder with a delay flip-flop in a feedback loop.

3,638,004

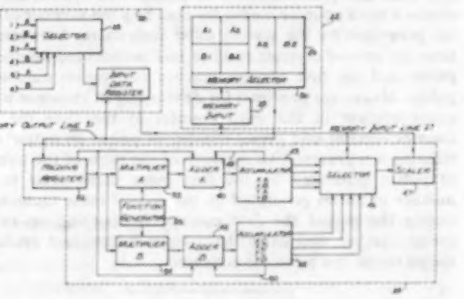
FOURIER TRANSFORM COMPUTER

Edwin A. Sloane, Los Altos; Bruce T. McKeever, Sunnyvale, and Burtis W. Meyer, Saratoga, all of Calif., assignors to Time/Data Corporation, Palo Alto, Calif.

Filed Oct. 28, 1968, Ser. No. 771,031

Int. Cl. G06f *15/34, 7/38*

U.S. Cl. 235—156 **13 Claims**



A digital computer for rapidly determining the Fourier transform of a real input signal is disclosed. The computer utilizes the symmetries of sinusoidal functions to reduce the computations required to determine the Fourier transform. Simultaneous addition, multiplication and memory accessing are performed by the computer thereby reducing the time normally required to compute a Fourier transform.

3,638,005

SHIFT REGISTER OPERATED CALCULATING MACHINES

James John Drage, Uxbridge, Middlesex, England, assignor to Sumlock Anita Electronics Limited, Middlesex, England

Filed July 18, 1969, Ser. No. 843,138

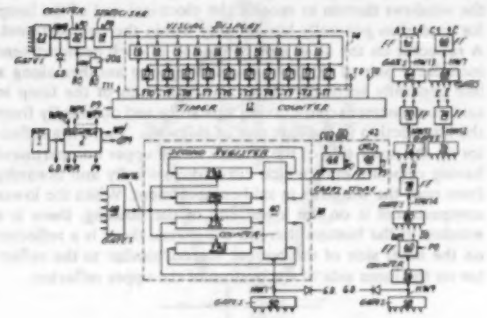
Claims priority, application Great Britain, July 18, 1968, 34,314/68

Int. Cl. G06f *7/385*

U.S. Cl. 235—160 **13 Claims**

An electronic calculating machine with at least two multistage registers capable of subtraction, with the digits of

the subtrahend and minuend aligned, has a circuit for controlling the shift of one register relative to the other in response to receipt of a predetermined plurality of electronic



shift pulses controlled by an arithmetic function circuit to shift the highest denomination stage of one register and to vary the number of shift pulses applied to both registers.

3,638,006

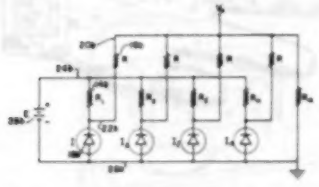
SOLID-STATE CORRELATOR

James J. Hogan, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Continuation-in-part of application Ser. No. 708,919, Feb. 28, 1968, now Patent No. 3,483,421. This application Dec. 11, 1969, Ser. No. 884,105

Int. Cl. G06g 7/19

U.S. Cl. 235—181 **5 Claims**



The invention relates to a solid-state area correlation device which can be associated with other separate components to achieve a closed-loop correlation function between two images. Specifically, an amplified correlation signal is generated within a single, solid-state sandwich with optical image information impinging on both sides of the sandwich, where the construction of the sandwich is such that maximum current flow therethrough is achieved when maximum correlation of the impinging image information is achieved. Separate standard phase discriminating and integrating circuits of the images are associated with the package or sandwich to determine when correlation of the images occurs.

3,638,007

DIGITAL CONTROL SIMULATOR

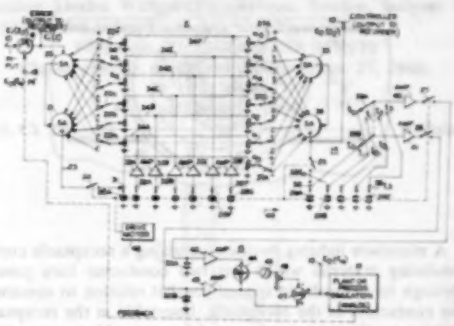
Herbert B. Brooks, 600 Washington Ave., Haddonfield, N.J.

Filed Aug. 5, 1969, Ser. No. 847,673

Int. Cl. G06g 7/66

U.S. Cl. 235—184 **19 Claims**

There is disclosed a simple inexpensive digital controller simulator for processing and modifying an analog input waveform to obtain a desired modification thereof empirically by controlling a set of calibrated potentiometer dials which represent coefficients of a signal equation that correspond to those coefficients used in programming a digital computer for process control to achieve the desired modification. This simulator stores sequential signal samples on capacitors and recalls the stored samples to merge together with the analog waveform modified samples which are controlled in amplitude by the calibrated potentiometers. A delay is simulated in the merged signals by sampling them over a further sequence of time intervals and storing in



capacitors for selective access. The delayed signals are then processed in a holding circuit providing a continuous selection of hold between zero and first order. The resulting processed signals then may be used for control of a plant or process from which feedback signals may be derived for merger with the analog input waveform to produce a closed loop control system.

3,638,008

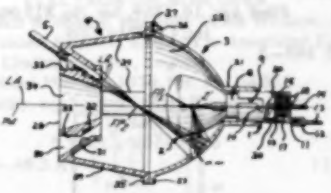
MULTIPLE LIGHT TRANSMISSION FROM A SINGLE LIGHT SOURCE

Joseph Richard Keller, and James Prituisky, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of application Ser. No. 591,254, Nov. 1, 1966, now abandoned. This application Apr. 29, 1969, Ser. No. 858,549

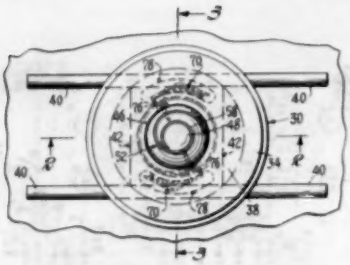
Int. Cl. G02b 5/14

U.S. Cl. 240—1 **11 Claims**



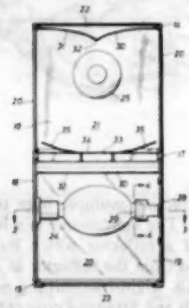
A device for effecting multiple light transmission from a single light source. The light source is a light bulb located at the focal point of a reflector which bulb emits light rays which are reflected from the reflector at an oblique angle to its transmission axis. Light-transmitting members are spaced in front of the bulb and arranged concentrically around, and at oblique angles to the transmission of axis of the reflector. In this manner the light-transmitting member will receive and transmit the maximum amount of light from the reflector.

3,638,009
MINIATURE LIGHTING DEVICE
Bernard V. Strianese, Manhasset, N.Y., assignor to Ackerman Engravers Inc., Long Island City, N.Y.
Filed Feb. 24, 1970, Ser. No. 14,263
Int. Cl. F21v 33/00
U.S. Cl. 240—2 W 13 Claims



A miniature lighting device comprising a receptacle cup of insulating material which has two conductor bars passing through its sidewalls in spaced parallel relation to constitute the contactors of the receptacle. Insertable in the receptacle cup is a miniature incandescent lamp assemblage comprising a lamp proper which has a glass envelope and lead wires extending from one end of the envelope, and a base disk of insulating material having a flatted portion at one side, adapted to fit into the receptacle cup between the conductor bars thereof. The flatted portion has a recess in which one end of the glass envelope is disposed, and has oppositely disposed side recesses adapted to receive central portions of the conductor bars when the base disk is turned while in the cup. Carried in the side recesses of the flatted portions are contactor elements which engage the conductor bars of the receptacle, said contactor elements being electrically connected respectively to the lead wires of the lamp envelope, thereby to conduct current to and from the filament in the envelope. The side recesses of the flatted portion when accommodating the parallel conductor bars of the receptacle function to lock the lamp assemblage in the receptacle after it has been turned therein. The action, however, is different from that of bayonet pins and slots of conventional lamps and receptacles, which also function to retain the lamps.

3,638,010
LIGHT FIXTURE
Buell Moore, Houston, Tex., assignor to Esquire, Inc., New York, N.Y.
Filed Apr. 10, 1969, Ser. No. 815,004
Int. Cl. F21p 5/00
U.S. Cl. 240—3 5 Claims



A light fixture comprising a housing adapted to be mounted in an upright position and having upper and lower lamp compartments. There is a window in each of a first pair of opposite sidewalls of each lamp compartment, with the windows in one compartment being vertically intermediate the windows in the other compartment. An electrical socket is mounted on a sidewall of each compartment intermediate the windows therein to receive the electrical end of the lamp for extension generally horizontally within the compartment. A reflector on the inner side of the top of each compartment includes a pair of portions intersecting one another along a line generally vertically aligned with the axis of the lamp in said compartment and curving upwardly and outwardly from the intersection to the first pair of sidewalls. There is a reflector on the inner side of the bottom of the upper compartment having opposite ends which curve downwardly and inwardly from near the windows in said compartment. When the lower compartment is on the lower end of the housing, there is a window in the bottom thereof: otherwise, there is a reflector on the inner side of the bottom thereof similar to the reflector on the inner side of the bottom of the upper reflector.

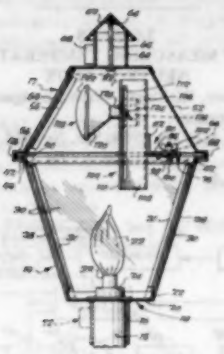
3,638,011
HAND GLOVE AND LIGHT SIGNAL ATTACHMENT THEREFOR
Merril H. Bain, 10333 South 74th Ave., Palos Hills, Ill., and Michael R. Bucher, 8250 West 90th St., Hickory Hills, Ill.
Filed June 1, 1970, Ser. No. 42,073
Int. Cl. A41d 19/00; G08b 5/00; F21v 33/00
U.S. Cl. 240—6.4 W 1 Claim

A combination hand glove and electric light signal attachment in which the electric light signal is mounted on the hand or finger portion of the glove and an electric battery and a manually operated switch unit for the electric light signal unit are mounted in the wrist portion of the glove as worn on one hand of the user. The switch unit is arranged in an electrical circuit which interconnects the light signal and the electric battery switch unit and when the wearer of the glove wishes to illuminate the electrical light signal he may do so by manually actuating the switch unit with his free hand, thereby closing the electrical circuit to the electric light signal.

3,638,012
LIGHTING FIXTURE
Robert E. Lenz, Snyder, and Stephen J. Wargo, Buffalo, both of N.Y., assignors to Forsyth Industries, Inc., East Aurora, N.Y.
Filed Dec. 1, 1969, Ser. No. 881,086
Int. Cl. F21s 1/00, 3/00
U.S. Cl. 240—25 9 Claims

A lighting fixture housing having a lower portion for mounting a light source therein. A spot light assembly is mounted in the upper portion of the housing and is concealed by a housing cover having a plurality of opaque sidewalls and an opening in one of the sidewalls. The spotlight assembly is adjustably mounted for linear and pivotal

movement in both a vertical and a horizontal plane to permit the passage of an optimum amount of light rays through the



opening onto an intended object located at various elevations and angular positions.

3,638,013

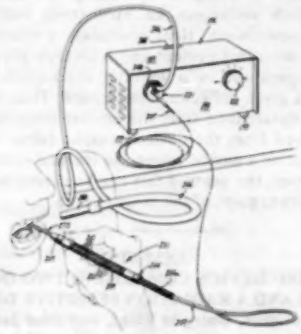
DENTAL APPARATUS UTILIZING FIBER OPTICS

Ronald F. Keller, Aptos, Calif., assignor to Fiber-Photics, Inc., Santa Cruz, Calif.

Continuation of application Ser. No. 674,706, Oct. 9, 1967, now abandoned. This application Apr. 2, 1969, Ser. No. 812,823

Int. Cl. A61b *1/06*

U.S. Cl. 240—41.15 **16 Claims**



Dental apparatus having a case with a lamp mounted in the case and producing a focused source of light at a predetermined focal point. A socket assembly is mounted in the case in the vicinity of the lamp. The socket assembly has at least first and second openings therein with the first opening being substantially larger than the second opening. A first large fiber optics cable is provided and has one end mounted in the first opening in the socket assembly so that it faces the focused source of light. The other end of the large fiber optics cable is adapted to be positioned to provide general illumination of a predetermined area. A second small fiber optics cable is provided and has one end mounted in the second opening in the socket assembly and also facing the focused source of light. A tool is mounted on the other end of the second cable so that the second cable provides a beam of light to provide localized illumination for use of the tool. The tool can be in the form of a hand dental mirror having a headlike substrate with a reflecting surface thereon and handle means secured to the substrate and connected to the second fiber optics cable. The hand dental mirror includes means for causing substantially all the light passing from the fiber optics cable connected to the handle means to pass from the substrate in a direction generally perpendicular to the reflecting surface and from a generally localized area with respect to the substrate.

3,638,014

VEHICLE TRACK BLOCK SIGNAL APPARATUS

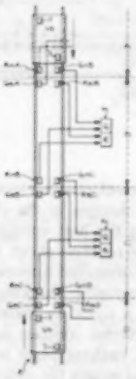
Gunnar Alexius Wallgard, Huskvarna, Sweden, assignor to SAAB Aktiebolag, Linkoping, Sweden

Filed Sept. 22, 1969, Ser. No. 859,970

Claims priority, application Sweden, Sept. 27, 1968, 13129/68

Int. Cl. B61l *13/00*

U.S. Cl. 246—91 **4 Claims**



The condition of a signal for each block of vehicle track corresponds to that of a bistable memory unit placed in one condition by momentary output of an arrival detector and in its other condition by momentary output of a departure detector. All detectors are actuated by a single type of vehicle-carried exciter. An arrival detector is located near each end of each block. A departure detector is spaced along the track from each arrival detector, in the direction away from the other arrival detector.

3,638,015

APERTURE PLATE CONTROL MECHANISM FOR ELECTRON MICROSCOPES

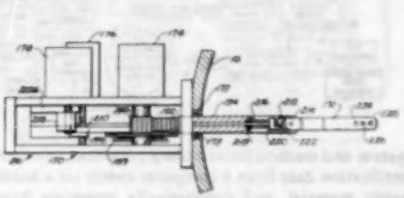
George William Browning, and John Lewis Williams, both of Saffron Walden, England, assignors to Associated Electrical Industries Limited, London, England

Filed Mar. 31, 1970, Ser. No. 24,355

Claims priority, application United Kingdom, Apr. 2, 1969, 17,343/69

Int. Cl. H01j *37/26*

U.S. Cl. 250—49.5 A 12 Claims



An electron microscope comprising a microscope chamber having an aperture plate control mechanism mounted

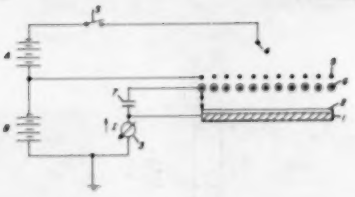
thereon and including an aperture support arm extending into the microscope chamber and mounted for movement along a longitudinal axis of said arm, and an aperture plate having at least one aperture, or passage, extending therethrough and being pivotably mounted on the support arm. First and second drive means are coupled to the support arm and the aperture plate, respectively, for varying the position of the aperture plate with respect to a beam of electrons.

3,638,016

SELF-BIASING GRID CONTROL CORONA SYSTEMS

Lee Fitzpatrick Frank, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 24, 1970, Ser. No. 31,717
Int. Cl. G03g *13/04*
U.S. Cl. 250—65 ZE 5 Claims



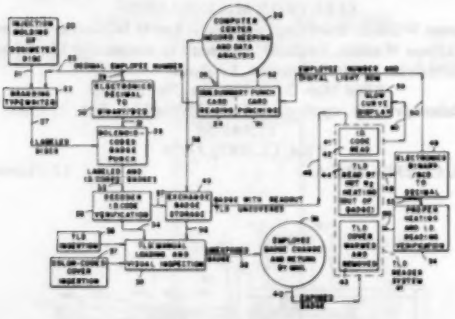
Contrast control in two-electrode electrographic apparatus is achieved by sensing changes in the charging current and automatically correcting the bias voltage or terminating the charge deposition on the receiver sheet. For bias voltage correction, a capacitor is connected between the photoconductive grid and the xerographic backing plate. For charge deposition termination, a signal indicative of charge buildup is compared with an external contrast control signal and the electrical circuit to the backing plate is disconnected when the charge buildup signal equals the external contrast signal.

3,638,017

THERMOLUMINESCENT DOSIMETER ENCODING AND READOUT METHOD

Donald E. Jones, Livermore, and Kermit F. Petrock, Walnut Creek, both of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 23, 1969, Ser. No. 887,694
Int. Cl. G01t *1/11, 7/08*
U.S. Cl. 250—71.5 R 5 Claims



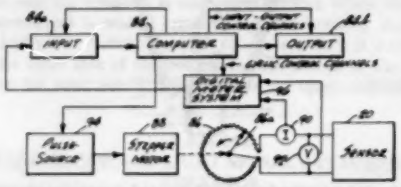
A system and method for encoding personnel or other type of identification data from a computer center on a holder for dosimetric material, and automatically removing from the holder the material and reading out radiation dosage thereon while decoding the identification data on the holder, and transmitting the readout and decoded data to the computer center. The encoding is accomplished in such a manner as to substantially eliminate accidental or intentional errors, while the dosimetric material is removed by vacuum means and readout in a hot oxygen-free gas, such as nitrogen.

3,638,018

MEANS OF MEASURING TEMPERATURE AND NEUTRON FLUX

Kenneth A. Gasper, Richland, Wash., assignor to McDonnell Douglas Corporation

Filed July 14, 1969, Ser. No. 841,423
Int. Cl. G01t *3/04*
U.S. Cl. 250—83.1 15 Claims



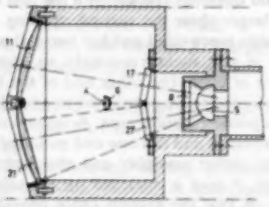
Temperature-sensing device including an emitter capsule containing a radioisotope fuel, a collector housing enclosing the emitter capsule, emitter capsule support means which produces a dominant thermal conduction loss in the heat balance of the device and which maintains the external emitter surface at a predetermined spacing from the internal collector surface, a cesium vapor source communicating with the interelectrode space, and emitter and collector connections providing an electrical output from the device. In this device, collector temperature is directly coupled to emitter temperature and allows determination of ambient (collector) temperature from emitter temperature which can be accurately derived from the device's output curve. Neutron-flux-sensing device is obtained by fueling the device with a material which undergoes an exothermic reaction under neutron bombardment. Heat produced is directly proportional to neutron flux present and is directly proportional to emitter temperature in a thermal conduction dominated device, for a given collector temperature. Thus, the neutron flux can be determined from the emitter temperature which can be derived from the device's output curve. Alternately, in this device or a device where the thermal conduction loss is not dominant, the neutron flux can be determined from the maximum power point of the output curve.

3,638,019

LIGHTING DEVICE COMPRISING TWO OPTICAL SYSTEMS AND A RADIATION SENSITIVE DETECTOR

Francois Desvignes, Bourg la Reine, and Jean Jacques Hunzinger, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 14, 1970, Ser. No. 28,324
Claims priority, application France, Apr. 4, 1969, 6910560
Int. Cl. G01j *1/42*
U.S. Cl. 250—83.3 H 9 Claims



A sighting device equipped with two optical systems which each comprise an optical modulator and a lens and the opti-

cal axes of which intersect at an acute angle and with a radiation-sensitive detector is described. It is shown that by inserting auxiliary radiation sources between the lenses of the optical systems and the radiation-sensitive detector and by using the lenses as catadioptric systems for imaging the auxiliary radiation sources asymmetrical errors can be eliminated.

3,638,020

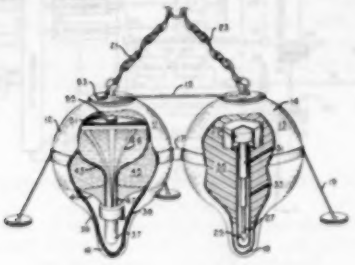
MINERAL-DETECTION APPARATUS

Dick Duffey, Adelphi; Peter F. Wiggins, Annapolis, and Frank E. Senftle, Chevy Chase, all of Md., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 26, 1970, Ser. No. 40,644

Int. Cl. G01t *4/6*

U.S. Cl. 250—83.3 R **4 Claims**



A marine mineral-detection apparatus is described including a ^{252}Cf source of neutrons and a lithium-drifted germanium radiation detector shielded from the neutron source. The neutron source is mounted on an extensible member supported within a mass of neutron-shielding material. The source is extended outside the neutron shield to bombard surrounding mineral values with neutrons. Elements capturing neutrons give off prompt gamma radiation with discrete energies. The radiation detector resolves the radiation into distinct energy peaks for identifying the elements present in the mineral values.

3,638,021

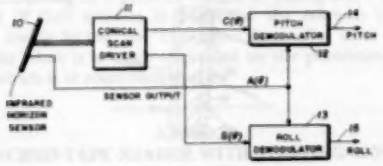
INFRARED HORIZON SENSOR FOR MEASURING SATELLITE PITCH AND ROLL

Robert L. Hickerson, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 19, 1969, Ser. No. 851,405

Int. Cl. G01j *1/20*

U.S. Cl. 250—83.3 H **4 Claims**



An infrared sensor carried aboard a satellite is driven to conically scan the horizon of the celestial body, such as the earth, about which the satellite is orbiting. The output of the sensor is a signal whose amplitude is constant when the satellite is in its nominal attitude and whose amplitude varies sinusoidally if the satellite attitude deviates from nominal. This output from the sensor is combined with signals responsive to the scan drive mechanism uniquely defining the scan angle, so as to produce output signals indicating pitch and roll of the satellite.

3,638,022

LOW-ENERGY NUCLEAR RADIATION DETECTOR OF THE SEMICONDUCTOR TYPE

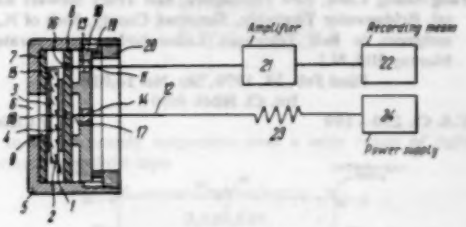
Stanislav Fedorovich Kozlov, B. Akademicheskaya ulitsa, 49, korpus, 1, kv. 18, Moscow, U.S.S.R.

Filed Sept. 22, 1969, Ser. No. 859,739

Claims priority, application U.S.S.R., Sept. 20, 1968, 1272308; Jan. 31, 1969, 1302862

Int. Cl. G01t *1/24*

U.S. Cl. 250—83.3 R **4 Claims**



A device for detecting low-energy nuclear radiations and nuclear radiations in corrosive (reactive) media with a detector on the basis of a diamond crystal plate with contacts formed at the opposite sides thereof, one of these contacts disposed on the plate side adapted to be irradiated is made blocking in relation to charge carriers, while the opposite contact disposed on the plate side not adapted to be irradiated is made of a material capable, in conjunction with a diamond, of injecting charge carriers under the influence of an applied electric field, the blocking contact being made of metal carbides.

3,638,023

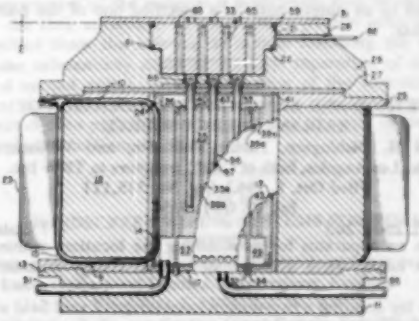
RADIOISOTOPIC POWER SOURCE

Alfred E. Cottam, Marianna; John W. H. Chi, Pittsburgh; Chang-Kyo Kim, McMurray, and Robert Flaherty, Pittsburgh, all of Pa., assignors to the United States of America as represented by the U.S. Atomic Energy Commision

Filed Nov. 7, 1969, Ser. No. 874,750

Int. Cl. G21h *1/00*

U.S. Cl. 250—106 **7 Claims**



A power source adapted for refueling during operation including a core structure having longitudinal openings for holding radioisotopic fuel elements and longitudinal passageways for passing process fluid flow. Each fuel element

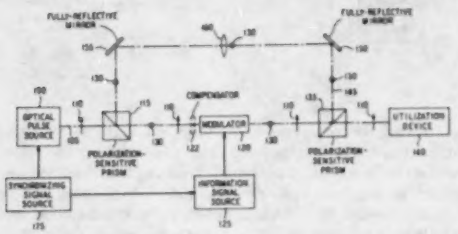
opening is sealing separated from the process fluid flow passageways. The process fluid flow passageways are arranged in an even number of annular patterns or passes such that the process fluid inlet and outlet conduits are located at one end of the core. The fuel element openings are accessible at the opposite end of the core to allow fuel replacement without loss of process fluid. A fuel element shipping and transfer cask is adapted to be attached to the heat source opposite the coolant ports for replacing spent fuel elements within the core structure. A passive, self regulating, and recoverable emergency cooling system prevents core melt down on loss of coolant flow.

3,638,024

OPTICAL PULSE INTERVAL MODULATION SYSTEM

Fang-Shang Chen, New Providence, and Tracy Stewart Kinsel, Bridgewater Township, Somerset County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 25, 1970, Ser. No. 14,010
Int. Cl. H04b 9/00
U.S. Cl. 250—199 **7 Claims**



Electrical information signals are utilized to modulate the regularly spaced-apart optical pulses provided by an input source such as a mode-locked laser. The modulation process involves selectively delaying each input optical pulse such that it occurs in a specified one of the plural time slots defined between adjacent ones of the unmodulated pulses. (This process has been designated pulse interval modulation.) Modulation is accomplished by utilizing at least one polarization-sensitive prism and a modulator element responsive to the electrical information signals for changing the polarization condition of optical pulses propagated through the element. An optical pulse whose polarization condition is altered by the modulator element is made to repeatedly traverse a storage path. After a predetermined number of such traversals, the polarization condition of the pulse is altered by the modulator element whereby the pulse is then directed to an output path in a specified one of the plural time slots.

3,638,025

METHOD AND APPARATUS FOR LOCATION OF RADIANT ENERGY SOURCE

Roland H. Dishington, Pacific Palisades, and William R. Hook, Los Angeles, both of Calif., assignors to TRW Inc.

Filed Oct. 1, 1963, Ser. No. 315,111
Int. Cl. G01s 9/64
U.S. Cl. 250—203 **7 Claims**

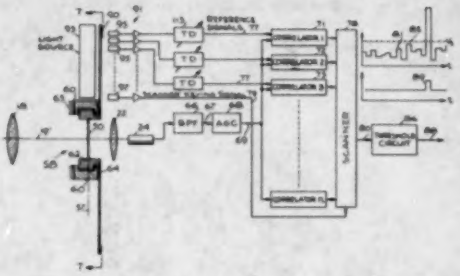
2. In an apparatus for determining the location, within a radiant energy field of view, of radiant energy emanative areas:

means for creating a two-dimensional image of said field at a reference plane;

means for modulating the radiation intensity at first and second elemental portions of said image in accordance with first and second substantially random functions, respectively, so that the modulation waveform imposed on first and second elemental bundles of rays are distinctively indicative of the respective geometrical coordinates of the different elemental areas of the field of view from which said rays emanate;

photosensitive transducer means for generating an electrical signal which varies in amplitude as a function of the total radiant power of the radiation passed by said modulating means;

means for providing first and second reference signals respectively representative of the different substantially random modulations which said modulating means would impose on rays emanating from first and second elemental



areas of said field of view;

correlation means for separately deriving the product of said electrical signal and said first reference signal and the product of said electrical signal and said second reference signal; and

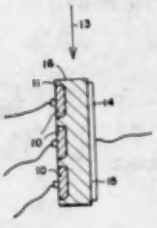
means for separately integrating said products over a time period which is at least as long as the period of the lowest frequency component generated by said modulating means to produce information signals indicative of the presence and absence of high-intensity discontinuities at the first and second elemental areas of the field of view which are represented by said first and second reference signals.

3,638,026

MULTICOLOR PHOTOVOLTAIC DEVICE

Myrsyl W. Scott, and Ernest L. Stelzer, both of Minnetonka, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed June 29, 1970, Ser. No. 50,484
Int. Cl. H01j 39/12
U.S. Cl. 250—211 J **12 Claims**



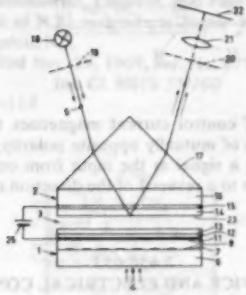
A photovoltaic device having peak response at several different wavelengths is formed by a body of a semiconductor alloy material having a compositional gradient and containing diffused PN-junctions in regions of different composition, the energy gap of the material being dependent upon the composition of the alloy.

3,638,027

IMAGE DISPLAY DEVICE COMPRISING AN AUXILIARY LIGHT SOURCE

Hein Koelmans, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1970, Ser. No. 18,675
Int. Cl. H01j 31/50
U.S. Cl. 250—213 R 5 Claims



In an image display device comprising a photoconductive layer for collecting an incident radiation image and a field-strength-sensitive medium affected thereby, which medium in turn modulates an auxiliary light beam, the photoconductive layer has to be effectively screened from the auxiliary light. According to the invention an intermediate layer is used for this purpose which consists of a semiconductor whose energy gap is a few tenths ev. smaller than the energy gap of the photoconductive material. This is fulfilled by using copper-activated CdSe for the photoconductor and a semiconductor of the group CdTe, GeS and Sb_2Se_3 and mixtures thereof for the intermediate layer. The latter two materials have the advantage that they can be vapor-deposited on a substrate which is at room temperature. The vapor-deposited substances are thus prevented from producing intermediate levels in the photoconductor, in which case the long-wave portion of the auxiliary light passing through the intermediate layer might release charge carriers in the photoconductor. A layer consisting of 3 parts by weight of Sb_2Se_3 and 1 part by weight of GeS satisfies in particular the relevant requirements owing to the fine crystalline form of a layer of this material when it is vapor-deposited on the photoconductive layer which is at room temperature.

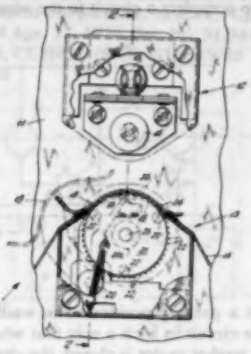
3,638,028

PUNCHED TAPE READER WITH STEPPING MOTOR AND SPROCKET DRIVE

Elmer Madsen, and Hermann Rosshirt, both of Bristol, Conn., assignors to The Superior Electric Company, Bristol, Conn.

Filed June 17, 1968, Ser. No. 737,399
Int. Cl. G01n 21/30
U.S. Cl. 250—219 D 3 Claims

A reader for reading the coded perforations in a punched tape to supply electrical signals representative thereof that has a sprocket wheel drive that is directly connected to the axis of a stepping motor with the motor taking a plurality of steps for each incremental movement of the tape and in which photodiodes and a light source are used for reading so as to be accurately responsive over a wide range of light permeability of the tape.

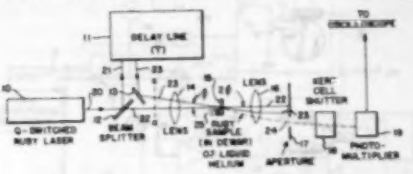


3,638,029

METHOD AND APPARATUS FOR GENERATING PHOTON ECHO PULSES

Sven R. Hartmann, Dobbs Ferry, N.Y.; Norman A. Kurnit, Boston, Mass., and Isaac D. Abella, Chicago, Ill., assignors to Albert C. Nolte, Jr., Borough of Manhattan New York, N.Y.

Continuation-in-part of application Ser. No. 456,240, May 17, 1965, now abandoned. This application July 7, 1969, Ser. No. 843,281
Int. Cl. F21k 7/00
U.S. Cl. 250—225 13 Claims



A material which is capable of absorbing and storing the energy of illuminating pulses is illuminated by a first high-intensity light pulse, and is subsequently illuminated by a second high-intensity pulse. When the homogeneous relaxation process of the material is sufficiently long as compared to the time separation of the pulse, a photon echo pulse is emitted from the material at a time following the second pulse substantially equal to the time separation of the first and second pulses. In a modification of the invention, the first and second pulses are angularly displaced, and the photon echo pulse is thereby emitted at an angle of twice the displacement from the first pulse.

3,638,030

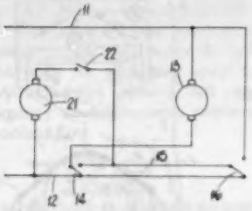
WINDSCREEN WIPING SYSTEMS FOR ROAD VEHICLES

Walter Mellor, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 5, 1970, Ser. No. 8,995
Claims priority, application Great Britain, Feb. 19, 1969, 8,891/69
Int. Cl. H02g 3/00
U.S. Cl. 307—10 2 Claims

A windscreen wiping system for a road vehicle includes a windscreen wiper motor, a windscreen washer motor, a

manually operable switch for controlling the wiper motor and a parking switch operable in synchronism with the wiper motor and serving when the manually operable switch is in its off position to complete a circuit to the wiper motor until the



wipers reach a parking position. The washer motor is connected in the circuit in such a way that when a switch in series with the washer motor is closed, the circuit to the washer motor is completed each time the parking switch moves to its parking position.

3,638,031

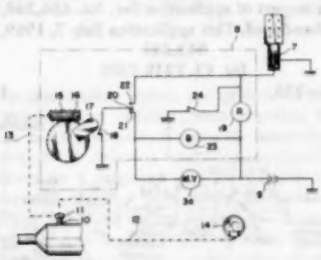
CENTRAL OIL FEEDING AUTOMATIC CONTROL DEVICE FOR VEHICLES

Takeo Honda, Kawagoe, and Toshifumi Tonegawa, Saitama-ken, both of Japan, assignors to Diesel Kiki Kabushiki Kaisha, Shibuya-ku, Tokyo, Japan

Filed July 27, 1970, Ser. No. 58,498

Int. Cl. F01m *1/00*

U.S. Cl. 307—10 R **1 Claim**



A central oil-feeding automatic control device, which can automatically operate every certain distance of running of vehicle, comprising an electric circuit including a switch opening and closing by a cam rotatable with a drive shaft, normally open and closed fixed contacts, a movable contact, electromagnetic coils of a valve and said relay, a bimetal coil, a hydraulic pressure responsive switch and a bimetal switch.

3,638,032

FAST-ACTING MAGNETIC SWITCHING DEVICE FOR HIGH-LEVEL ELECTRICAL SIGNALS AND DIVERTER INCORPORATING SAME

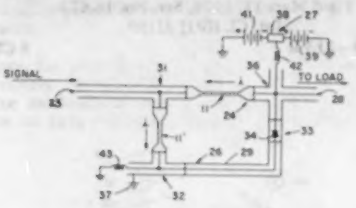
Dean O. Kippenhan, Castro Valley, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 4, 1970, Ser. No. 8,503

Int. Cl. H03k *17/80*

U.S. Cl. 307—88 LC **4 Claims**

A tubular element of magnetizable material is coaxially interposed between inner and outer coaxial conductors so as to be magnetizable to one of two oppositely polarized states depending upon the direction of flow of a low-level DC control current through the inner conductor. A high-level time varying signal applied at one end of the conductors is transmitted to the opposite end thereof, or blocked depending upon whether the induced magnetic field of the signal reenforces the polarity of the magnetizable element or opposes same. A pair of the switching devices included in a pair of circuit paths coupled to a common signal input and arranged such



that the flow of control current magnetizes the respective devices to states of mutually opposite polarity, are effective to rapidly divert a signal at the input from one path to the other in response to a reversal of the direction of control current flow.

3,638,033

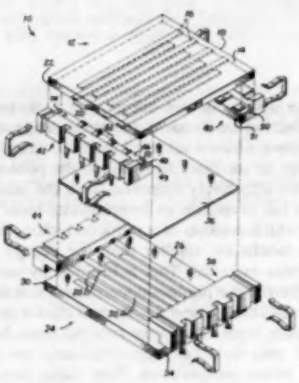
DISPLAY DEVICE AND ELECTRICAL CONDUCTORS THEREFOR

Richard E. Johnson, Sugar Grove, and Paul R. Natale, Warren, both of Pa., assignors to Sylvania Electric Products Inc.

Filed May 11, 1970, Ser. No. 36,183

Int. Cl. H01j *1/62, 63/04*; **H05k** *1/02*

U.S. Cl. 313—108B **10 Claims**



A compact visual display device having crossed arrays suitable for flush mounting comprising a display assembly having a first light-transmitting grid structure and a second grid structure with an electrically luminescent medium therebetween, each grid structure having a base of electrically insulative material and a conductive side of the base containing two sets of parallel, elongated, electrical-conductive, electrical-individual elements, each set extending partially across the conductive side from opposing sides of said conductive side, the first and second grid structures are disposed such that the sets of elongated elements in the first grid structure is normal to the sets of elongated elements in said second grid structure, the electrical connection for the display device is provided by an electrical connector for each set of conductors that comprises a body of electrically insulative material having a rectangular contact surface and two rectangular bearing surfaces at right angles to and extending from opposite edges of the contact surface and in an opposite direction thereto. U-shaped clamps hold the connectors, grid members and the electrically luminescent medium in a fixed

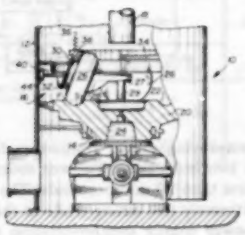
relationship wherein edges of the grid members are in abutment with the appropriate bearing surface of the connector. The electrical connection is established by a resilient electrically conductive contact member bearing against each elongated member in said grid structures. The electrical connectors have a dimension that is normal to the contact surface that is equal to the sum of the thickness of each grid structure and the luminescent medium therebetween.

3,638,034

SKID DETECTOR FOR PULVERIZER

Chester J. Romanowski, Carteret, and Paul V. Guido, Cedar Grove, both of N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Filed Nov. 19, 1969, Ser. No. 877,991
Int. Cl. H01h *35/100*
U.S. Cl. 307—119 **11 Claims**



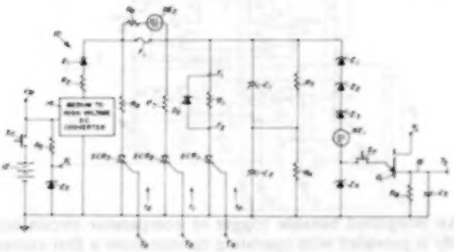
Means are provided for detecting skidding of rollers. A limit switch is actuated at each rotation of a member which when no roller skidding occurs moves at the same linear speed as the rollers but which moves at a greater speed when such skidding occurs to energize an electrical circuit, which will indicate when the member is moving at a speed which indicates skidding of the rollers.

3,638,035

PRIMARY AND SECONDARY SHUNT PATHS FOR DISSIPATING AN ELECTRICAL CHARGE

John N. Murphy, Pittsburgh, and Merle L. Bowser, Bethel Park, both of Pa., assignors to The United States of America as represented by the Secretary of the Interior

Filed Mar. 23, 1971, Ser. No. 127,112
Int. Cl. F42d *5/00*
U.S. Cl. 307—141 **8 Claims**



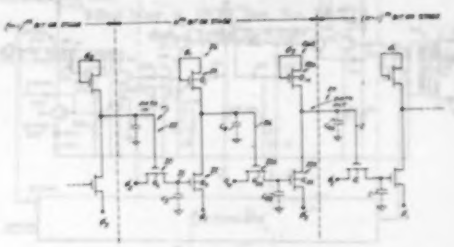
A permissible blasting machine employs a capacitive discharge circuit for electrically detonating an explosion in a hazardous environment. Protective circuitry prevents capacitor discharge until full charge is reached. After detonation, redundant circuitry dissipates any charge remaining in the circuit. A failure of the dissipating circuitry disables the discharge system.

3,638,036

FOUR-PHASE LOGIC CIRCUIT

Henry Peter Zimbelmann, East Setauket, N.Y., assignor to General Instrument Corporation, Newark, N.J.

Filed Apr. 27, 1970, Ser. No. 31,944
Int. Cl. H03k *19/08*; **G11c** *19/00*
U.S. Cl. 307—205 **18 Claims**



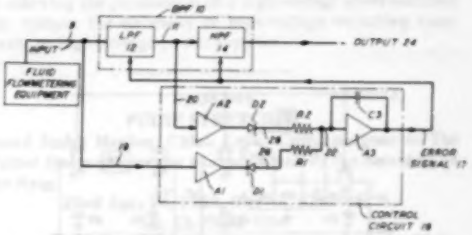
A four-phase logic circuit characterized by a double inverter comprising a series of FETs utilizing unconditional charge and conditional discharge of the output node. Only one FET is interposed in the discharge path. The discharge FET is controlled by a clock pulse connected through a FET which is in turn controlled by the data signal.

3,638,037

AUTOMATIC TRACKING FILTER

Charles Louis McMurtrie, North Plainfield, N.J., assignor to Eastech, Inc., South Plainfield, N.J.

Filed May 26, 1970, Ser. No. 40,630
Int. Cl. H03d *13/00*
U.S. Cl. 307—233 **19 Claims**



An automatic tracking filter for use in conjunction with fluid flowmeters automatically locks onto the largest signal in a given frequency spectrum. The filter comprises a narrow band-pass filter having input and output filter circuits (e.g., a low-pass and a high-pass filter) connected in series. The output of the input filter circuit is combined in a control circuit with the input signal to generate an error signal which is used to tune each of the filter circuits to the input signal. In one embodiment disclosed the filter sections are two-pole active R-C filters in which a field-effect transistor is used as a voltage variable resistor.

3,638,038

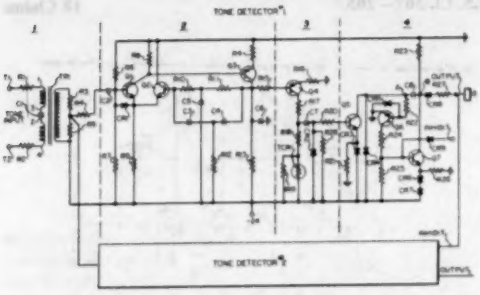
TONE DETECTOR CONTROL CIRCUIT

Vernon F. Weber, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 12, 1970, Ser. No. 80,001
Int. Cl. H03k *5/20*
U.S. Cl. 307—233 **8 Claims**

A tone detector control circuit arrangement for detecting a tone of a particular frequency and level. The circuit includes an input circuit, a twin "T" active filter, a buffer amplifier

and an alternating current level detector. The level detector is a form of monostable circuit with a feedback path including a capacitor, and the signal is applied to one side of the capacitor whereby the circuit may be maintained in the conductive state during the presence of the tone.

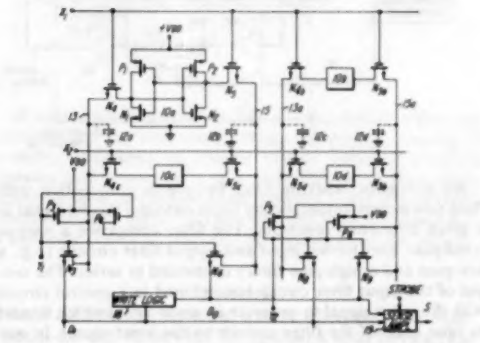


3,638,039

OPERATION OF FIELD-EFFECT TRANSISTOR CIRCUITS HAVING SUBSTANTIAL DISTRIBUTED CAPACITANCE

Vallon Wei-Loong Chen, Edison, N.J., and Hiroshi Amemiya, Morrisville, Pa., assignors to RCA Corporation

Filed Sept. 18, 1970, Ser. No. 73,507
Int. Cl. G11c *11/34*
U.S. Cl. 307—238 **11 Claims**



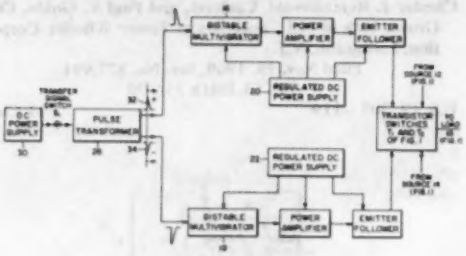
The distributed capacitance at circuit nodes between conduction paths of interconnected field-effect transistors of a memory decoder is maintained charged to a fixed value during the major portion of the memory operating time. As one example, the distributed capacitance at a column of the memory may be connected to the charging source except for the brief intervals during which a location in that column is being accessed. Operation in this way improves both the speed and reliability of the decoder circuit.

3,638,040

SYSTEM FOR ASYNCHRONOUS SWITCHING OF A LOAD FROM ONE POWER SOURCE TO ANOTHER

Aly A. Mahmoud, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 5, 1970, Ser. No. 61,162
Int. Cl. H03k *17/00*
U.S. Cl. 307—243 **4 Claims**



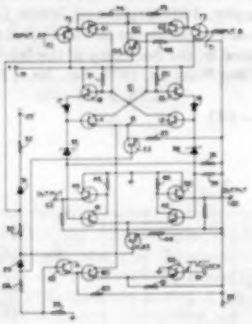
A system employing power transistors for transferring a load between two independent power sources at any phase angle and in less than 20 microseconds. The system is unique in that it is extremely fast acting while at the same time does not require power source synchronization and produces no circulating currents during the switching interval.

3,638,041

SAMPLE AND HOLD TRIGGER CIRCUIT

James E. Thompson, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 2, 1970, Ser. No. 94,287
Int. Cl. H03k *17/00*
U.S. Cl. 307—247 **11 Claims**



An integrated bistable trigger or comparator circuit normally is provided with operating current from a first current source, and the state of the trigger circuit is changed by a differential input circuit operated with a second current source providing a greater current than the first current source for altering the current drawn by the load resistors of the trigger stage to change its balance and thereby change its state. A third current source is connected to the trigger circuit in parallel with the first current source and is operative to draw a greater predetermined current than that provided by the second current source, so that when the third current source

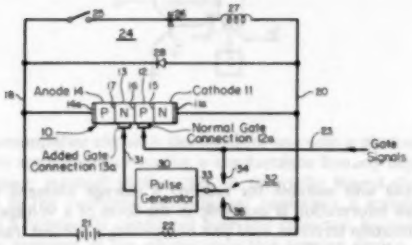
is operating, the input signals have no effect on the operation of the trigger circuit. A clock signal controlled switch is provided for disabling the third current source to permit the trigger circuit to be responsive to input signals.

3,638,042

THYRISTOR WITH ADDED GATE AND FAST TURN-OFF CIRCUIT

George H. Studtmann, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed July 31, 1969, Ser. No. 846,395
Int. Cl. H03k *17/00, 17/56*
U.S. Cl. 307—252 G **16 Claims**



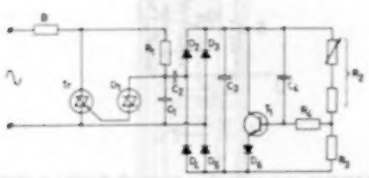
A PNPN-thyristor has an extra gate connection added in the N-region adjacent the outer P-region. A pulse generator applies a turnoff control signal to the added gate when turnoff across the anode-cathode connections is initiated, to sweep out the carriers at the center junction rather than allow the carriers to normally recombine over a longer time period. The connection to the added gate can be extended in area, either in the operation by which the extra connection is added to a conventionally produced PNPN-thyristor, or by varying the manufacturing process by which the PNPN-thyristor is produced.

3,638,043

CURRENT CONTROL DEVICE

Robert Ronald Laupman, Wijchen, Netherlands, assignor to N. V. Auco, Wijchen, Netherlands

Filed Oct. 6, 1969, Ser. No. 863,891
Claims priority, application Netherlands, Oct. 9, 1968, 68/14,447
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 B **16 Claims**



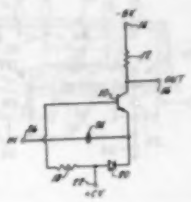
A device for controlling an electrical current through a load by means of a bilateral controlled rectifying element. Said element is fired periodically through a bilateral rectifier which in its turn receives a firing signal through a series capacitor included in the output circuit of a control amplifier, which at its input receives stimuli for firing said controlled rectifying element. Said series capacitor is effective to improve the symmetry of the waveform of the current through the load, while also the current control range is increased thereby.

3,638,044

HIGH-VOLTAGE SHORT-DURATION PULSE GENERATOR

Cornelius P. Pittman, Garland, Tex., assignor to Beckman Instruments, Inc.

Filed Mar. 4, 1970, Ser. No. 16,279
Int. Cl. H03k *5/00*
U.S. Cl. 307—264 **17 Claims**



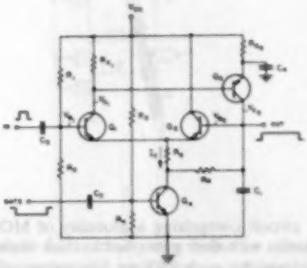
An electronic circuit for producing high-voltage short-duration pulses including means for superimposing an input pulse on the voltage level of a first power supply and switching means for alternately placing on an output line the voltage of a second power supply and the output of the voltage superimposing means so that the total voltage rise of the output pulse is equal to the sum of the voltage of the input pulse and the total voltage differential between the first power supply and the second power supply. This circuit lends itself to cascading such that each additional stage will add to the output of the previous stage a voltage equal to the voltage differential between the first and second power supply, thus allowing the production of a high-voltage short-duration pulse without the necessity of high-voltage switching components or high-voltage power supplies.

3,638,045

PULSE STRETCHER

Richard Smith Hughes, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

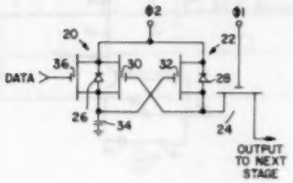
Filed Apr. 14, 1969, Ser. No. 815,708
Int. Cl. H03k *5/04*
U.S. Cl. 307—267 **1 Claim**



A follow-hold circuit wherein the output follows the input until an external gating trigger disables the circuit whereupon the output remains at the last input level until the gating trigger enables the circuit again wherein the circuit com-

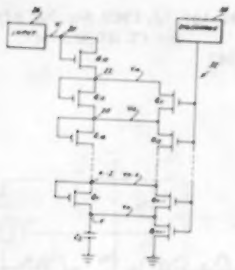
prises a differential feedback video amplifier and transistorized switch.

3,638,046
FET SHIFT REGISTER STAGE
Alton O. Christensen, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Dec. 12, 1969, Ser. No. 884,397
Int. Cl. H03k *3/286;* **G11c** *11/34*
U.S. Cl. 307—279 **5 Claims**



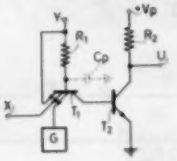
In a shift register, a cross-coupled combination of an IGFET inverter and an IGFET NOR gate, each using a Schottky diode as a precharging device, is used in each stage to provide a fast, low-loss transfer of logic information from one stage of the shift register to the next.

3,638,047
DELAY AND CONTROLLED PULSE-GENERATING CIRCUIT
Leonard F. Klein, Rockville Center, N.Y., assignor to General Instrument Corporation, Newark, N.J.
Filed July 7, 1970, Ser. No. 53,041
Int. Cl. H03k *5/159, 17/28*
U.S. Cl. 307—293 **20 Claims**



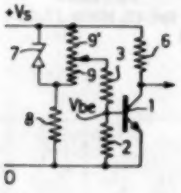
A delay circuit comprising a plurality of MOSFETS connected in series with their gates tied to their drains. The input signal is delayed by each FET an interval equal to the time required to charge its gate terminal to the threshold voltage of the device. The signals generated at the junction of the output circuits of different FETs may be used to generate pulses of controlled width and phase relationship. Means to discharge the junction nodes are provided.

3,638,048
STORE READ UNITS
Ferdinand Camerik, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 14, 1970, Ser. No. 2,825
Claims priority, application Netherlands, Jan. 16, 1969, 6900697
Int. Cl. H03k *17/00*
U.S. Cl. 307—299 **4 Claims**



Read unit suitable for reading a storage element whose stored information is available in the form of a voltage at an information terminal, said unit comprising a second transistor controlled by a first transistor, the latter being rendered conducting when the former is cut off for conducting away the charge accumulated in the base of the second transistor.

3,638,049
NETWORK HAVING A RESISTANCE THE TEMPERATURE COEFFICIENT OF WHICH IS VARIABLE AT WILL
Johannes Gerardus Wouterus Bom, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 19, 1969, Ser. No. 825,825
Claims priority, application Netherlands, May 17, 1968, 6806969
Int. Cl. H03k
U.S. Cl. 307—310 **13 Claims**



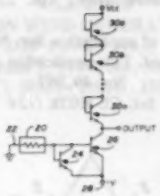
A temperature compensation network having a resistance that exhibits a temperature coefficient that is adjustable substantially independently of the voltage applied to the network. The network includes a resistive voltage divider connected in parallel with the emitter-collector path of a transistor. The base of the transistor is connected to a tapping on the voltage divider. A zener diode having a zero temperature coefficient relative to the transistor temperature coefficient is connected to the voltage divider, whereby the network exhibits a net negative temperature coefficient of resistance.

3,638,050

PREAMPLIFICATION CIRCUITRY FOR PHOTOCONDUCTIVE SENSORS

Edgar E. Harp, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 1, 1970, Ser. No. 24,606
Int. Cl. H03k 17/00
U.S. Cl. 307—311 10 Claims



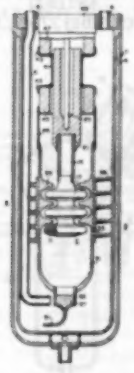
A preamplifier circuit is disclosed for use with a photoconductive sensing device having a conductance linearly dependent upon incident photon flux. A forwardly biased diode, which in the preferred embodiment comprises a transistor having a commonly connected base and collector, is coupled to one terminal of the photoconductive sensing device. An output transistor is connected to the sensing device and the diode to provide an output signal dependent upon the magnitude of incident photon flux upon the sensing device. This output signal is not dependent upon the magnitude of conductance of the sensing device, and thus the present circuit may be used in a photoconductive sensor array to eliminate the requirement of sensor alignment. A plurality of series connected diodes are connected between a source of bias voltage and the output transistor to provide a selected constant gain to the output signal.

3,638,051

NUCLEAR THERMIONIC GENERATOR WITH COMPOSITE PARTICLE CATHODE

Arthur Martin Weis, Pittsburgh, Pa., assignor to Nuclear Materials and Equipment Corporation, Apollo, Pa.

Filed Feb. 10, 1964, Ser. No. 343,585
Int. Cl. G21d 7/00
U.S. Cl. 310—3 4 Claims



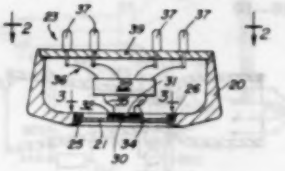
This invention relates to the art of generating power and has particular relationship to thermionic generators of electrical power.

3,638,052

ELECTROACOUSTIC TRANSDUCERS OF THE BILAMINAR FLEXURAL VIBRATING TYPE

Frank Massa, Cohasset, Mass., assignor to Dynamics Corporation of America, Massa Division, Hingham, Mass.

Continuation-in-part of application Ser. No. 859,677, Sept. 22, 1969, now Patent No. 3,578,995. This application Feb. 12, 1970, Ser. No. 10,748
Int. Cl. H04r 17/00
U.S. Cl. 310—8.2 7 Claims



A transducer includes a piezoelectric driven, vibratile diaphragm which acts as the closure for a circular opening in a rigid housing which encloses electronic components. The flexure mode of the diaphragm is controlled to give a sound pattern which is more uniform over a large area. The housing and diaphragm assembly is combined with a set of electrical terminals which serve as a plug for inserting the transducer assembly into a mating socket. The resulting structure provides an economical transducer design with improved sound radiation characteristics and controlled uniformity in large production quantities.

3,638,053

TERRAIN PROBE FOR SCANNING TIME BEHAVIOR OF STRESS WAVES IN A MEDIUM

Vladimir Schenk; Zdenek Pros, and Ludvik Waniek, all of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie ved, Prague, Czechoslovakia

Filed Apr. 13, 1970, Ser. No. 27,851
Int. Cl. H01v 7/00
U.S. Cl. 310—8.3 4 Claims

A terrain probe for scanning time behavior of stress waves in a medium by means of a piezoelectric element mounted in a hollow tubular pointed body. More particularly a constructional arrangement to locate measuring elements for evaluating the stress waves propagating in a medium to be examined. The tubular body includes moreover an electric conductor attached to the piezoelectric element and adapted for transmitting pulses corresponding to the wave characteristics

to a recording apparatus. The scanning sensitivity of the piezoelectric element is enhanced in that the frequency of the latter oscillating between the walls of the tubular body is more than two digits higher than the frequency of the waves to be examined.

3,638,054

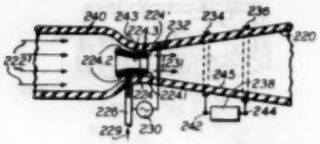
ALTERNATING CURRENT ELECTROFLUID DYNAMIC ENERGY CONVERSION DEVICE

Richard F. Honigsbaum, 21 A Barry Gardens, Passaic, N.J.

Filed Apr. 4, 1969, Ser. No. 813,517

Int. Cl. H02n 3/00; G01f 1/00

U.S. Cl. 310—10 **30 Claims**



An energy conversion device of the alternating current electrofluid dynamic type uses the electric field coupling between a spatio-temporally periodic charge distribution in a fluid stream and a plurality of electrodes at different points along the stream to interchange alternating current electrical energy at the electrodes with the flow energy of the stream. Energy can flow in either direction. If the device is used to supply an electrical load connected to the electrodes it is an alternating current electrofluid dynamic generator and can also be used as an amplifier, oscillator, flow meter, and the like. If the device is supplied alternating current electrical energy in order to accelerate the fluid it is an alternating current electrofluid dynamic pump and can also be used as a compressor, thrust engine, and the like. A nozzle and charging electrode arrangement is used to produce the spatio-temporally periodic charge distribution.

3,638,055

ELECTRICAL APPARATUS

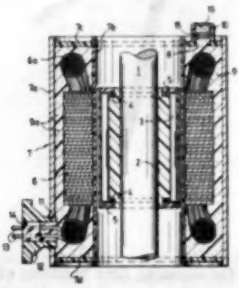
Urs Zimmermann, Wildberg, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed June 29, 1970, Ser. No. 50,817

Claims priority, application Switzerland, July 4, 1969, 10225/69

Int. Cl. H02k 1/04

U.S. Cl. 310—43 **5 Claims**



The housing for the winding is provided with at least two openings, one for the conductors for the winding and one for the pouring in of the hardenable mass. Each opening is sealed in sequence by first sealing the opening for the conductors by means of a glass plug and thereafter sealing the pour-in opening by means of a disk and plug or a seal ring and plug.

3,638,056

ELECTRICAL GENERATION APPARATUS

Paul Imris, West Shore Apts., Apt. 224-West Walk, West Haven, Conn.

Continuation-in-part of application Ser. No. 703,510, Jan. 22, 1968, now abandoned. This application June 24, 1970, Ser. No. 49,387

Int. Cl. H02k 1/24

U.S. Cl. 310—261 **3 Claims**

Electrical generation apparatus characterized in that the apparatus incorporates a rotating member comprising a rectangular prism, preferably having a base in the form of an equilateral triangle, which is rotated about an axis extending substantially through its center of gravity. In certain embodiments of the invention, the aforesaid axis is parallel to an applied field of force, either electrostatic or magnetic, through which the member passes as it rotates, the axis being at the edge of the field.

3,638,057

FIBER-OPTICAL PLATE COUPLING A LUMINESCENT SCREEN FOR THE DISPLAY OF AN IMAGE TO A PHOTOCONDUCTIVE LEAD MONOXIDE TARGET OF A TELEVISION CAMERA TUBE

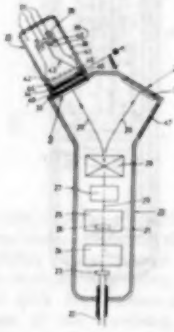
Peter Johannes Michiel Janssen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 7, 1969, Ser. No. 848,178

Claims priority, application Netherlands, Aug. 14, 1968, 6811521

Int. Cl. H01j 31/49, 31/00

U.S. Cl. 313—2 **1 Claim**



An image transmission system for coupling a luminescent screen for displaying an image to a photoconductive lead

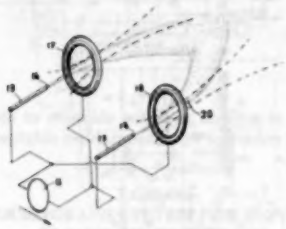
monoxide target of a television camera tube comprises an fiber-optical plate employing light-conducting fibers between the luminescent screen and the television camera tube. The luminescent screen luminesces principally in a spectral region below about 4,000 A. and the fibers are coated with a material having a relatively high absorption at least in that region, and preferably the coating is opaque.

3,638,058

ION WIND GENERATOR

Robert S. Fritzius, 3328 Cowley Way, #2, San Diego, Calif.

Filed June 8, 1970, Ser. No. 44,207
Int. Cl. H05h ; H05b ; H01j 7/24
U.S. Cl. 313—63 5 Claims



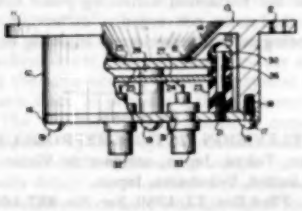
An ion wind generator in which a plurality of cathodes is disposed in operable proximity to a plurality of anodes forming an array with a high-voltage electric field on the order of 10 kilovolts per centimeter impressed between them causing the formation of ions which, in turn, are attracted by the anodes creating an ionic wind in the direction from the cathodes to the anodes, the adjacent anodes and cathodes being impressed with opposite polarity fields for neutralizing the ionic content of the combined windstreams.

3,638,059

EXTREME ULTRAVIOLET RADIATION PHOTOMETERS

Randolph G. Taylor, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 27, 1970, Ser. No. 31,891
Int. Cl. H01j 39/26, 39/00
U.S. Cl. 313—93 9 Claims



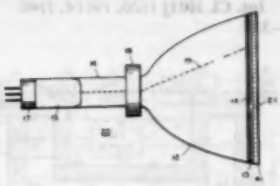
This disclosure is directed to an extreme ultraviolet radiation photometer which includes a special type window and cathode suitable for permitting radiation to penetrate the window which reacts with the cathode to produce electrons which are attracted to the window and produces a current flow which is measured to represent the radiation detected.

3,638,060

PHOSPHOR DISPLAY SCREEN AND FILTER INCLUDING PLATINUM AND MANGANESE CHLORIDE DERIVATIVES OF TETRAPHENYLPORPHIN

Paul Wacher, Bayside, N.Y., assignor to GTE Laboratories Incorporated

Filed May 25, 1970, Ser. No. 41,134
Int. Cl. H01j 5/16, 61/40; G01b 5/20
U.S. Cl. 313—112 9 Claims



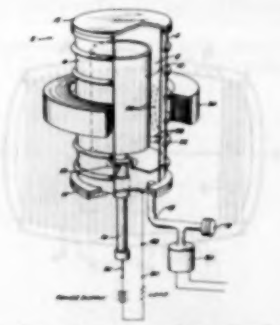
A high-contrast display apparatus adapted for viewing in an environment of ambient light. A display screen is provided for producing an image consisting of a narrow band of wavelengths in the green region of the spectrum. Overlaying the display screen is a filter which consists of a layer of didymium glass coated with a layer of acrylic ester polymer. The polymer contains metal derivatives of tetraphenylporphin. The filter substantially absorbs the visible wavelengths incident upon it which are outside the spectral band emitted by the display screen.

3,638,061

MAGNETICALLY CONTROLLED CROSSED-FIELD INTERRUPTER AND SWITCH TUBE WITH PRESSURE CONTROL FOR LONG DURATION PULES

Michael A. Lutz, Los Angeles, and Ronald C. Knechtli, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of application Ser. No. 664,722, Aug. 31, 1967. This application July 15, 1970, Ser. No. 55,124
Int. Cl. H01j 7/16, 7/20
U.S. Cl. 313—161 8 Claims



In the absence of appropriate means for controlling the gas pressure, the time during which a crossed-field electrical switch can conduct is limited by the rapid pumping action of the discharge. The present invention discloses a crossed-field discharge switch in which pressure control is accomplished by selection of gas and electrode materials to minimize gas losses, and means is provided for adding additional gas, if

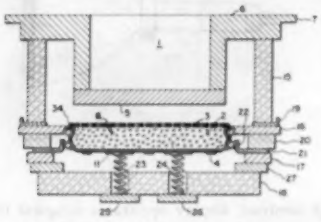
needed. This structure permits a crossed-field electrical switch device to conduct for reasonable lengths of time without off-switching due to gas losses.

3,638,062

SUPPORT FOR COMPOSITE ELECTRODE STRUCTURE

James E. Beggs, Schenectady, N.Y., assignor to General Electric Company

Filed Oct. 23, 1970, Ser. No. 83,307
Int. Cl. H01j *1/20, 19/14, 1/46*
U.S. Cl. 313—337 10 Claims



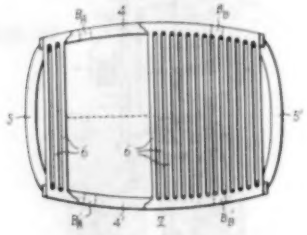
An electron discharge device of the planar electrode-type and having a bonded heater-cathode control electrode assembly, employs two garter springs which engage peripheral grooves in the assembly to support rigidly the assembly in the tube structure and at the same time provide low-inductance connections to the control and cathode electrodes. Springs for making contact to the heater of the assembly also force one of the garter springs into engagement with a stop to achieve desired positioning.

3,638,063

GRID STRUCTURE FOR COLOR PICTURE TUBES

Takuji Tachikawa; Akio Ohgoshi; Joshida Susumu; Akira Nakayama, and Eiji Ishii, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 10, 1969, Ser. No. 790,350
Claims priority, application Japan, Jan. 11, 1968, 43/1658; 43/1659
Int. Cl. H01j *1/46*
U.S. Cl. 313—348 9 Claims



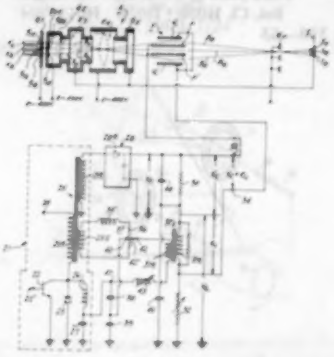
A support for the grid structure of a cathode-ray tube in which the support is stressed to compensate for any expansion of the grid wires due to heating, the support having a pair of opposed parallel arms with the grid wires attached to and extending transversely between the arms, and a pair of braces supporting the arms at the Bessel points, the braces being stressed in a direction substantially parallel to the direction of the grid wires so that as the grid wires expand due to heat the braces will expand a corresponding amount to maintain a substantially constant tension of the grid wires.

3,638,064

CONVERGENCE DEFLECTION SYSTEM FOR A COLOR PICTURE TUBE

Mitsuru Hosoya, Kanagawa-ken; Hiroshi Sahara, Tokyo, and Minoru Morio, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 13, 1969, Ser. No. 832,907
Claims priority, application Japan, June 15, 1968, 43/40979
Int. Cl. H01j *29/50*
U.S. Cl. 315—13 16 Claims



In a color picture tube in which a plurality of beams are made to intersect each other at a location between the beam generating sources and the color screen and are focused on the latter by a main focusing lens positioned to dispose its optical center substantially at the location where the beams intersect so that beams emerge from such lens along divergent paths, first and second spaced plates are disposed at opposite sides of each of the divergent paths to electrostatically deflect the respective beam and cause convergence of all of the beams at a common area on the screen when the first and second plates are at different potentials, a high voltage is generated from a horizontal deflecting pulse provided for causing the beams to scan the screen and such high voltage is applied to an anode electrode of the tube and also to each first plate, and a static convergence deflecting voltage is obtained by dividing the aforementioned high voltage and is applied as the potential difference between the first and second plates by which the respective beam is to be deflected. Further, a dynamic convergence deflecting voltage, comprising both parabolic and sawtooth voltages is generated in response to the horizontal deflecting pulse and is superimposed on the static convergence deflecting voltage with provision being made for separately adjusting both deflecting voltages.

3,638,065

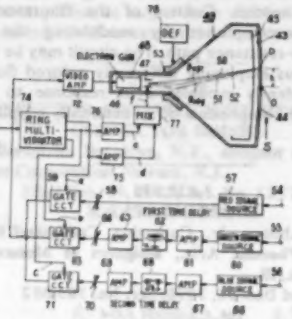
COLOR TELEVISION PICTURE-REPRODUCING DEVICE

Ichiro Ueno, Tokyo, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 22, 1969, Ser. No. 887,140
Claims priority, application Japan, Dec. 24, 1968, 43/94425
Int. Cl. H01j *29/50*
U.S. Cl. 315—13 10 Claims

A color television picture reproducing device provides varying time lags to a plurality of color signals. These time lags cause an intensity modulation of a plurality of electron beams produced by at least one electron gun unit and not simultaneously concentrated on a particular point on a phosphor screen. Thus, a plurality of television pictures may

be reproduced on the phosphor screen by the electron beams striking phosphors on the phosphor screen. These pictures



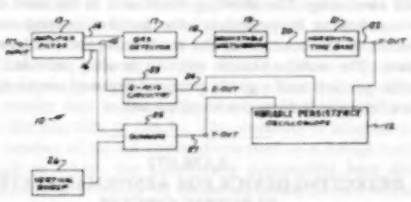
can be made to coincide with one another in space to provide an acceptable reproduced color television picture.

3,638,066

CONTOUROGRAPH SYSTEM FOR MONITORING ELECTROCARDIOGRAMS

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Donald P. Golden, Jr., Webster; Donald G. Mauldin, Houston, and Roger A. Wolthuis, Seabrook, all of Tex.

Filed Aug. 21, 1970, Ser. No. 65,840
Int. Cl. H01j *29/70*
U.S. Cl. 315—25 **5 Claims**



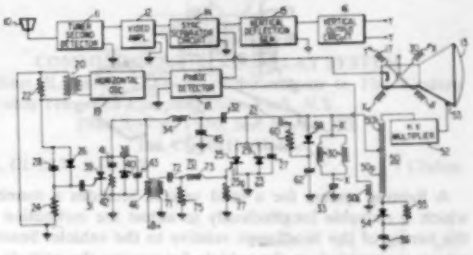
The system of the present invention processes semiperiodic electrical signals such as an electrocardiogram to produce a real time signal display on the face of a variable persistence cathode ray tube in an oscilloscope. Each cycle of the signal being processed is formed on a separate horizontal base line which is spaced vertically below the trace formed by the preceding cycle. Each of the waveforms is organized about a prominent cyclical event with all similar events aligning in approximately the same vertical plane. The system intensifies portions of each trace to produce a three-dimensional contour effect. The resultant display called a contourogram tends to suppress cycle-to-cycle redundancies and to emphasize cycle-to-cycle differences which increases the ability to visually detect any waveform anomalies representative of an abnormality associated with the signal source. Real time display of a single, full cycle of the signal on one horizontal base line, even where no prominent or detectable signal excursion marks the beginning on one cycle and the end of the preceding cycle is effected by keying the oscilloscope sweep trace for the beginning of the real time cycle to a dominant event in the preceding cycle with circuitry which provides a delay between the occurrence of the signaling event and the initiation of the sweep for forming the following, real time trace.

3,638,067

TRIGGERING CIRCUIT FOR CRT DEFLECTION SYSTEM UTILIZING AN SCR

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation

Filed Aug. 25, 1969, Ser. No. 852,673
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 TD **10 Claims**



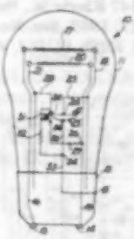
In a television receiver employing a two SCR horizontal deflection circuit, a triggering waveform recurring at the horizontal or line deflecting rate is applied to a series resonant circuit having differentiating means coupled to the junction of the series resonant elements to provide gate signal to turn the trace SCR on and assist in turning it off during each horizontal deflection cycle.

3,638,068

DUAL INTENSITY SIGNAL LAMP

Hobert Earl Wilson, Las Vegas, Nev., assignor to Ralph C. Watson, Las Vegas, Nev., a part interest

Filed Jan. 8, 1970, Ser. No. 1,520
Int. Cl. B60q *1/38*; **H01k** *1/64, 9/08*
U.S. Cl. 315—67 **10 Claims**



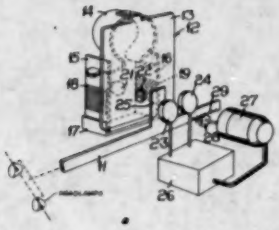
A combination dual intensity signal lamp having a constant intensity control filament, a two-position switch actuated by the energization of the control filament to a second position and actuated by the deenergization of the first filament to a first position and a dual intensity signal lamp circuit containing the switch which connects the circuit for a high-intensity mode of operation in the first position and for a low-intensity mode of operation in the second position.

3,638,069

LIGHTING SYSTEMS FOR ROAD VEHICLES

Alfred Dickens Baker, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 18, 1970, Ser. No. 12,169
Claims priority, application Great Britain, Feb. 24, 1969, 9,702/69
Int. Cl. B60q 1/02, 1/10
U.S. Cl. 315—82 4 Claims



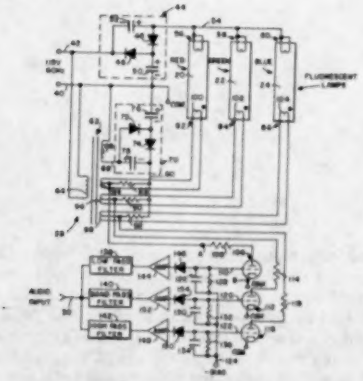
A lighting system for a road vehicle includes a member which is movable longitudinally to adjust the inclination of the beams of the headlamps relative to the vehicle. Sensing means is provided on the vehicle for sensing the attitude of the body of the vehicle relative to the ground, and a light source is movable in response to the signal received from the sensing means. A pair of light-sensitive devices are positioned side-by-side, and control operation of an actuating device for moving the headlamp-adjusting member. The headlamp-adjusting member carries a mask which is movable between the light-sensitive devices and the light source, and which, when the headlamps are correctly inclined for a given attitude of the body of the vehicle relative to the ground, masks both of the light-sensitive devices from the light source. When both of the light-sensitive devices are masked then the actuating device is inoperative. However, if the attitude of the body of the vehicle relative to the ground changes the light source is moved accordingly, and light falls on one or other of the light-sensitive devices. When light falls on one of the light-sensitive devices the actuating device is operated to move the headlamp-adjusting member to adjust the inclination of the headlamp beams in the correct direction so that the stable position is reestablished where the mask blocks light from falling on both of the light-sensitive devices.

3,638,070

FLUORESCENT LAMP STARTING AND CONTROL CIRCUIT

Richard W. Powell, 19147 Kinzie St., Northridge, Calif.

Filed Oct. 17, 1969, Ser. No. 867,239
Int. Cl. H05b 41/392, 41/44
U.S. Cl. 315—163 19 Claims



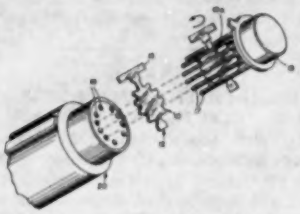
A fluorescent lamp starting and control circuit and a color display employing same. A pair of power supplies respectively provide a high-positive voltage directly to the anode and a high-negative voltage via a large resistance to the cathode of a fluorescent lamp. Subsequent to starting, lamp current flows through a unidirectional, low-resistance path back to power supply neutral. Control of the fluorescent lamp brightness is accomplished by modulating the current through this low-resistance path. The circuit may be used in a display apparatus employing differently colored fluorescent lamps independently modulated in response to selected frequency range components of an externally supplied audio signal.

3,638,071

SHORTING DEVICE

Wilhart Niilo Altonen, Jr., Cupertino, Calif., and Fred Vincent Auer, Phoenix, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 31, 1970, Ser. No. 103,052
Int. Cl. H05f 3/04
U.S. Cl. 317—2 R 10 Claims



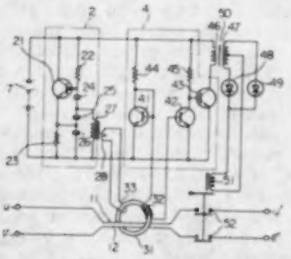
There is disclosed a unitary conducting planar shorting member for use in transporting semiconductor devices such that all the leads from the semiconductor device are provided with an equipotential plane so as to eliminate damage from static electricity. The shorting member is in the form of a circle notched at its periphery, the notches corresponding in position to the position of the leads from the semiconductor device. The notched-circle portion is also provided with a handle portion and a guide portion disposed on an opposite side of the circle from the handle portion.

3,638,072

DETECTING DEVICE FOR ABNORMAL STATE IN ELECTRIC CIRCUIT

Kazuo Kobayashi; Yoshihiko Okuda, and Sadao Kawamoto, all of Kadoma-shi, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 5, 1970, Ser. No. 16,854
Claims priority, application Japan, Mar. 19, 1969, 44/21002; Mar. 24, 1969, 44/22206; Mar. 26, 1969, 44/23332
Int. Cl. H02h 3/28
U.S. Cl. 317—27 R 4 Claims



The invention provides a detecting device for abnormal state in electric circuit. The device comprises an input terminal which varies depending on given situation, a high-

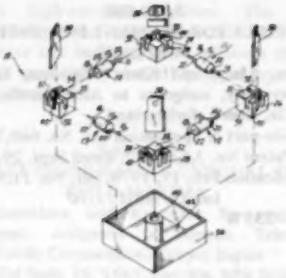
frequency oscillating circuit, and an amplifier having saturated input and output characteristics. Input signals from said input terminal are mixed with output signals from said high-frequency oscillating circuit, and thus mixed output is applied to the amplifier, an output from which actuates trip coil of an associated cutoff means for the electric circuit.

3,638,073

SEMICONDUCTOR ASSEMBLY WITH HEAT SINK AND CONNECTOR BODIES

Bernard Bernstein, Brooklyn, N.Y., assignor to General Instrument Corporation, Newark, N.J.

Filed Feb. 19, 1970, Ser. No. 12,728
Int. Cl. H01l *1/16*
U.S. Cl. 317—100 **16 Claims**



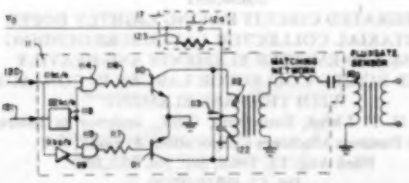
A semiconductor assembly comprises a plurality of semiconductor components each having a first and second terminal means operatively connected respectively to first and second parts of the components and extending outwardly therefrom, and a plurality of spaced-apart electrically conductive bodies each having a groove adapted to receive the terminals means of the semiconductor components. The bodies are heat sink blocks and the terminal means on the semiconductor components are flexible wires which are received in the grooves in the blocks, the components thereby being supported between blocks. Excellent heat dissipation results due to the large heat conducting mass provided by the plurality of blocks. The assembly is adapted for use in a number of circuit applications such as a bridge rectifier circuit in which the electrically conductive heat sink blocks receive a plurality of diode terminals at the circuit junctions.

3,638,074

FLUXGATE MAGNETOMETER DRIVE CIRCUIT INCLUDING A SENSOR DEMAGNETIZER

George T. Inouye, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of application Ser. No. 700,396, Feb. 25, 1968, now Patent No. 3,509,424, dated Apr. 28, 1970. This application Apr. 27, 1970, Ser. No. 31,918
Int. Cl. G01r *33/02*; H01f *13/00*
U.S. Cl. 317—148.5 **6 Claims**



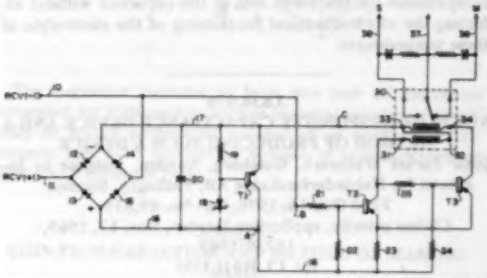
A drive circuit for a fluxgate magnetometer including a demagnetizing system for the fluxgate sensor. The drive circuit is arranged to minimize the second harmonic frequency of the drive frequency in the drive signal to reduce interference with the signal output from the magnetometer at the second harmonic frequency. The circuit draws current only half the time to conserve power and consequently reduce the weight of the power source. The drive voltage is derived from a crystal oscillator having a frequency four times that of the desired frequency and which is connected to the drive circuit through a pair of series connected divide-by-two flip-flops to develop a square wave. Demagnetization is achieved by momentarily increasing the current in the fluxgate sensor and then allowing it to decay back exponentially to a lower value.

3,638,075

COMMUNICATION LINE RELAY SYSTEM

William H. Brown, Mahwah, N.J., assignor to The Western Union Telegraph Company, New York, N.Y.

Filed Nov. 3, 1970, Ser. No. 86,521
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 R **7 Claims**



Disclosed is an improved communication line relay system for operating directly from line power including: an input-polarizing bridge circuit, a voltage-regulating circuit including a transistor and zener diode configured to bleed excess line current and to provide a regulated voltage. The system further includes a regenerative bistable circuit having a trigger input connected with the communication line for sensing the state of the received communication signal and a pair of regeneratively coupled transistors connected with the energizing coils of an output bipolar relay to apply the regulated power to the relay and to provide output states of the relay in accordance with the states of the received communication signal.

3,638,076

METAL-TO-GLASS-TO-CERAMIC SEAL

Edwin R. Koons, Whiteland, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Jan. 15, 1970, Ser. No. 3,158
Int. Cl. H01g *9/10*
U.S. Cl. 317—230 **11 Claims**

A seal comprising a metal member bonded to a glass member, said glass member in turn bonded to a ceramic

member, said glass member and said ceramic member being resistant to corrosive materials in the device being sealed, said metal member, glass member and ceramic member having compatible coefficients of thermal expansion.

3,638,077

ELECTROLYTIC CAPACITORS

Bernard Francois Gustave Chesnot, Paris, France, assignor to Les Condensateurs Sic-Safco, Colombes, France

Continuation-in-part of application Ser. No. 701,075, Jan. 29, 1968, now Patent No. 3,546,119. This application Apr. 2, 1970, Ser. No. 24,994

Int. Cl. H01g 9/02

U.S. Cl. 317—230 **4 Claims**

The present invention relates to electrolytic capacitors containing an electrolyte which is substantially nonaqueous, in which said electrolyte contains a dissolved chemical compound capable, as a result of the high-operating temperatures of the capacitor, of decomposing while at the same time giving off water and leaving a residue which remains dissolved, both the proportion and the solvent of this compound being so chosen that the dehydration of the latter substantially compensates for the water loss in the capacitor without affecting the electrochemical functioning of the electrolyte at these temperatures.

3,638,078

VOLTAGE-RESPONSIVE CAPACITANCE DEVICE AND A METHOD OF PRODUCING SUCH A DEVICE

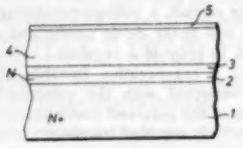
John Torkel Wallmark, Goteborg, Sweden, assignor to Institutet for Halvledarforskning AB, Vallingby, Sweden

Filed Oct. 16, 1970, Ser. No. 89,819

Claims priority, application Sweden, Nov. 17, 1969, 15739/1969

Int. Cl. H01l 3/00

U.S. Cl. 317—234 **9 Claims**



A voltage-responsive capacitance device comprises a body of semiconducting material of one conductivity type. On one surface of the semiconductor body an insulating layer is applied. In this layer electric charges can be permanently stored to form a barrier in the semiconductor body. By providing different nonuniform charge distributions in the insulating layer the capacitance-voltage relationship can be modified as desired. It is for instance possible to obtain a linear relationship, so that the capacitance is directly proportional to the voltage.

3,638,079

COMPLEMENTARY SEMICONDUCTOR DEVICES IN MONOLITHIC INTEGRATED CIRCUITS

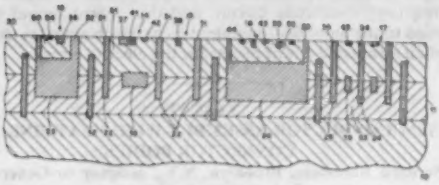
Tsiu C. Chan, Woburn, Mass., assignor to Sylvania Electric Products Inc.

Filed Jan. 28, 1970, Ser. No. 6,407

Int. Cl. H01l 19/00

U.S. Cl. 317—235 R **8 Claims**

Monolithic integrated circuit structure having an N-type substrate, a first P-type epitaxial layer, and a second N-type epitaxial layer. N-type isolation barriers extend through the P-type epitaxial layer and P-type isolation barriers extend through the N-type epitaxial layer to provide sectors including electrically isolated sections of the epitaxial layers. PNP and NPN-bipolar transistors of standard configuration, and



N-channel and P-channel junction field-effect transistors may each be fabricated in different sectors.

3,638,080

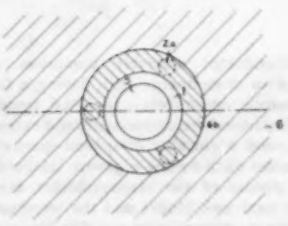
SEMICONDUCTOR ELEMENT FOR SWITCHING PURPOSES

Elmar Muller, Alzey, and Klaus Weimann, Lampertheim, both of Germany, assignors to Aktiengesellschaft Brown Boveri & Cie, Baden, Switzerland

Continuation-in-part of application Ser. No. 640,729, May 23, 1967, now Patent No. 3,531,697, dated Sept. 29, 1970. This application Feb. 17, 1970, Ser. No. 11,959

Int. Cl. H01l 11/10

U.S. Cl. 317—235 R **1 Claim**



A semiconductor device comprises a semiconductor element divided transversely into at least four zones which alternate in conductivity type. A control electrode is applied to a neighboring inner zone where this zone reaches to the outer surface of one of the outer zones through a perforation in the latter and metallizing is applied to this same surface but set back from the control electrode. The same outer zone has other perforations distributed therein and the neighboring inner zone extends as far as the metallizing. The perforations in the region of the vicinity of the control electrode are connected to the metallizing by a ring-shaped metallic layer which serves to short circuit the neighboring inner zone to the outer zone and also, upon a flow of anode current after firing, due to its relatively high resistance establishes a voltage drop sufficient for firing to spread rapidly at least regionally across the region of the outer zone not covered by metallizing.

3,638,081

INTEGRATED CIRCUIT HAVING LIGHTLY DOPED EXPITAXIAL COLLECTOR LAYER SURROUNDING BASE AND EMITTER ELEMENTS AND HEAVILY DOPED BURIED COLLECTOR LARGER IN CONTACT WITH THE BASE ELEMENT

Robert H. F. Lloyd, Sunnyvale, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

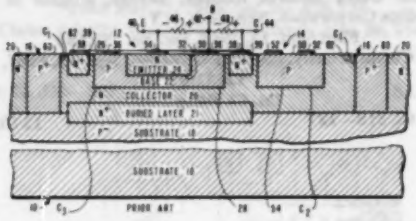
Filed Aug. 13, 1968, Ser. No. 752,207

Int. Cl. H01l 19/00

U.S. Cl. 317—235 R **7 Claims**

An integrated circuit is provided in which a heavily doped buried layer within the collector of a transistor extends into

contact with the base thereof to form the major portion of the collector-base junction. The buried layer enhances the current gain bandwidth by minimizing the width of the collector-base depletion region and the shift thereof into the



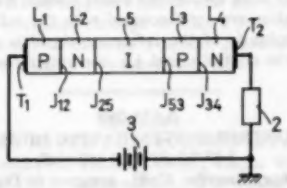
collector for high-current densities. The effects of capacitances at the collector-base junction and at the junctions of resistors and isolating walls adjacent the transistor are minimized by a lightly doped epitaxial layer within the collector of the transistor.

3,638,082

PNPN IMPATT DIODE HAVING UNEQUAL ELECTRIC FIELD MAXIMA

Yoshihiko Mizushima, and Kuniyasu Kawarada, both of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Sept. 19, 1969, Ser. No. 859,260
Claims priority, application Japan, Sept. 21, 1968, 43/68123
Int. Cl. H01l 9/10, 9/12, 11/10
U.S. Cl. 317—235 R **8 Claims**



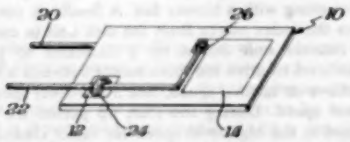
This invention relates to a high-frequency semiconductor device wherein the internal built-in electric field distribution in a semiconductor is made to have two peak values under a DC bias condition and an avalanche multiplication effect in the semiconductor is used to obtain a high-efficiency oscillation in a high-frequency region.

3,638,083

FUSIBLE CERAMIC CAPACITOR

John E. Dornfeld, Mequon, and Sidney B. Williams, Cedarburg, both of Wis., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 14, 1970, Ser. No. 63,808
Int. Cl. H01g 1/11
U.S. Cl. 317—247 **11 Claims**



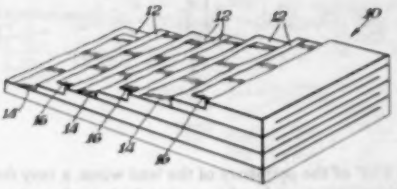
A fusible ceramic capacitor formed on a single dielectric substrate, having two capacitively coupled electrodes disposed on opposing surfaces thereof and further including a resilient lead wire fixedly attached to the ceramic substrate with one end bent into contact with one of the capacitor electrodes and connected thereto by means of a low melting point solder.

3,638,084

ENERGY STORAGE CAPACITOR

Ian Burn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed May 14, 1970, Ser. No. 37,082
Int. Cl. H01g 1/01
U.S. Cl. 317—258 **5 Claims**



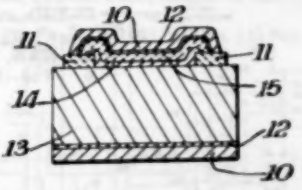
The capacitor includes at least one pair of electrodes separated by high-energy storage material consisting essentially of 85–95 percent by volume of an antiferroelectric ceramic and 5–15 percent by volume of nonreactive glass fired into a coherent body.

3,638,085

THIN FILM CAPACITOR AND METHOD OF MAKING SAME

Melvin Tierman, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Nov. 13, 1970, Ser. No. 89,206
Int. Cl. H01g 1/02
U.S. Cl. 317—258 **14 Claims**



A thin film capacitor having a counterelectrode of chromium overlaid by gold that completely buries the dielectric layer and protects same from any atmospheric or environmental contamination.

3,638,086

WOUND FILM CAPACITOR

Charles C. Rayburn, Falls Church, Va., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 5, 1970, Ser. No. 16,834
Int. Cl. H01g 1/14, 3/17
U.S. Cl. 317—260 **6 Claims**

Wound film capacitor and method of making wherein at least two layers of shrinkable thermoplastic dielectric are sandwiched between two layers of metallized or, preferably, foil, electrodes. A pair of lead wires are then positioned against the outer surfaces of the foils and rotated together in the manner of mandrels to wind the film and foil layers into a capacitor body. Flat, or otherwise deformed portions formed

on a short portion of one end of each lead wire which is outside of the capacitor during winding are then drawn into the center of the capacitor by pulling on the other end of the wires. The capacitor body is then heated to shrink the dielectric and thereby cause the leads to be held in extremely firm engagement with the foil layers. Since the foils encircle at

least 270° of the periphery of the lead wires, a very firm, low resistance, pressure bond is made which renders the capacitor able to withstand substantial amounts of heat applied during a soldering operation. The elimination of mandrel holes allows the capacitor to be extremely compact and usable for many applications without the addition of additional thicknesses of sealing materials.

3,638,087

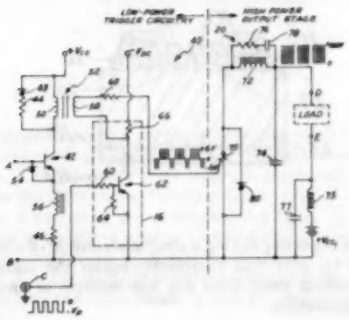
GATED POWER SUPPLY FOR SONIC CLEANERS

Henry Kevin Ratcliff, Davenport, Iowa, assignor to The Bendix Corporation

Filed Aug. 17, 1970, Ser. No. 64,545

Int. Cl. H01v 9/00

U.S. Cl. 318—118 **3 Claims**



A gated sonic power supply which permits selection of an optimum duty cycle and pulse repetition rate at which sonic energy must be pulsed to produce the most efficient degassing of tap water and/or uniform cavitation of a cleaning fluid. A pulse generator is used to trigger a gate within the sonic generator. The width of the pulse from the pulse generator determines the length of time that the sonic generator output signal is interrupted to give a pulse-modulated power output. The pulse width from the generator is variable to allow for the selection of a modulation width or duty cycle that gives a maximum efficiency of operation. Also, the frequency of the pulse from the pulse generator may be varied to select the optimum pulse repetition rate.

3,638,088

A DEVICE FOR GENERATING A VARIABLE LOW-FREQUENCY AC CURRENT USING PULSE SAMPLING TECHNIQUES

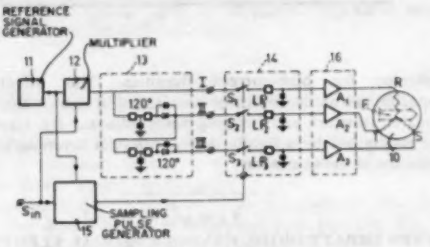
Ragnar Georg Jonsson, Kallhall, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 13, 1968, Ser. No. 759,686

Claims priority, application Sweden, Sept. 13, 1967, 12652/67

Int. Cl. H02p 5/00

U.S. Cl. 318—227 **12 Claims**



A motor speed control system that features a low-frequency generator for producing a variable frequency output voltage that varies as a function of a control signal. Motor speed is adjusted by varying the frequency of the stator voltage. The low-frequency generator supplies the adjustable stator voltage by sampling an AC reference signal of a frequency that is higher than the desired stator voltage frequency. The sampling pulses are synchronized with the reference signal and the amplitude of the reference signal is variable as a function of the control signal, i.e., the output frequency.

3,638,089

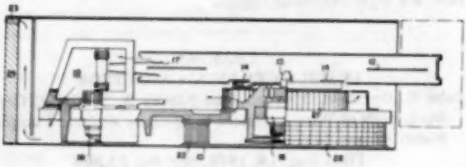
SPEED CONTROL SYSTEM HAVING HIGH AND LOW LEVEL SPEED MEANS

Andrew Gabor, Danville, Calif., assignor to Diablo Systems, Inc., Hayward, Calif.

Filed July 9, 1970, Ser. No. 53,532

Int. Cl. H02p 5/00; G11b 5/82

U.S. Cl. 318—318 **13 Claims**

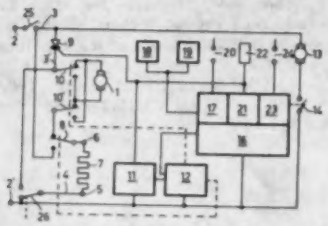


A speed control system for a magnetic disk drive where a DC drive motor is integrally mounted on the spindle of the disk drive along with a blower fan. A feedback control loop compares the index marks from the disk unit in conjunction with a counter unit driven by a oscillator to provide a reference level to drive the drive motor between a high-level speed, above its normal speed, and a low-level speed, below its normal speed. During the start up period the motor is maintained at the high-level speed for faster cleaning action and the heads are also landed at this speed after cleaning has occurred. An open loop system also provides high-level and normal speeds.

3,638,090
DRIVING ARRANGEMENT FOR THE DRUM OF A WASHING MACHINE

Willem Ebbinge, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 27, 1969, Ser. No. 828,128
Claims priority, application Netherlands, May 30, 1968, 6807615
Int. Cl. H02p 5/16
U.S. Cl. 318—345 8 Claims

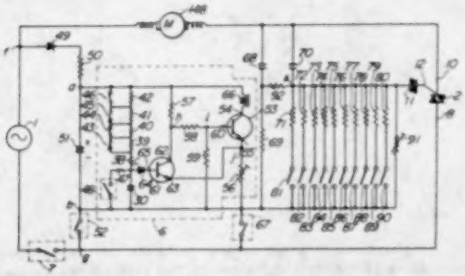


1. In an automatic washing machine including a commutating electric motor for driving the drum of the washing machine at a first comparatively low-washing speed and at a second comparatively high-spin-drying speed, the improvement comprising an automatic speed adjusting circuit for said motor comprising, a pair of input terminals adapted for connection to an AC voltage supply source, a supply circuit for the motor connected to the input terminals and provided with at least two further terminals, an electric heating element arranged to heat the wash water and connected across said two further terminals, a controlled rectifier connected in the supply circuit so as to regulate the motor speed at a given washing speed, and means connecting said two further terminals in the motor supply circuit so that the motor is at least substantially energized through at least a part of the heating element whereby it exhibits a speed characteristic which decreases very sharply with increasing load.

3,638,091
ELECTRIC POWER CONTROLLING APPARATUS

Tomoyuki Hosokawa, Takarazuka-shi; Chuzo Wada, Osaka, and Hiroshi Horii, Takatsuki-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 24, 1969, Ser. No. 879,188
Claims priority, application Japan, Nov. 25, 1968, 43/85605
Int. Cl. H02p 5/16
U.S. Cl. 318—484 6 Claims

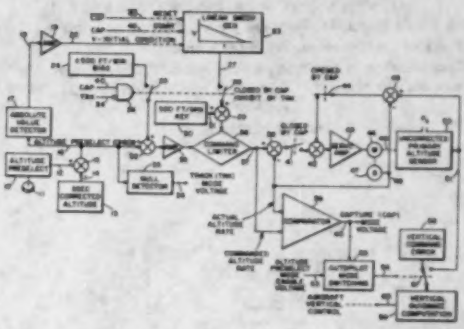


An electric power controlling apparatus, wherein the time for which electric power is supplied to a load is determined in accordance with a change of the charging or discharging time of a capacitor, the amount of power to be supplied to said load is determined in accordance with a change of the trigger phase of a thyristor, and said changes are achieved by selecting variable elements by the use of pushbutton switches.

3,638,092
ALTITUDE PRESELECT AND CAPTURE SYSTEM

Leo P. Kammerer, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Dec. 14, 1970, Ser. No. 97,742
Int. Cl. G05b 7/00
U.S. Cl. 318—584 12 Claims

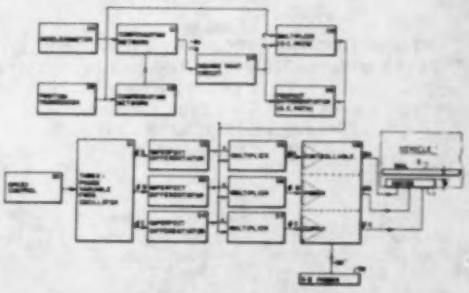


An altitude control system operating on a rate command principle employs an uncorrected primary altitude sensor in a servo loop which, in the absence of command operation, synchronizes the positioning of the sensor zero adjust mechanism with the experienced aircraft altitude rate. Rate command modes establish rate command inputs to the sensor servo loop while removing the synchronizing mode position feedback and initiate aircraft vertical control in response to sensor output signal. A corrected sensor may be employed to formulate altitude capture rate command inputs such that the system enjoys the reference accuracy of the corrected sensor and the rate sensitivity of the uncorrected sensor.

3,638,093
MAGNETIC SUSPENSION AND PROPULSION SYSTEM

James A. Ross, La Jolla, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Apr. 19, 1971, Ser. No. 131,041
Int. Cl. H02k 41/04
U.S. Cl. 318—687 34 Claims



A method and apparatus for supporting and translating a mass by magnetic attractive means. A ferromagnetic track may have repetitive magnetic discontinuities. A linear plural-phase ferromagnetic electric motor, which may be synchronous, supports the mass at a small gap below the track at zero frequency current variation through the motor. The same motor translates the mass along the track at a speed determined by the frequency of the plural-phase alternating current supplied to the motor. A nonlinear feedback

circuit having plural sensor elements controls the magnitude of the alternating current supplied to the motor. This maintains the gap substantially constant despite varying loads and gradually corrects for unevenness of the track. The feedback circuit provides uniform stability and uniform dynamic response regardless of the length of the gap.

3,638,094

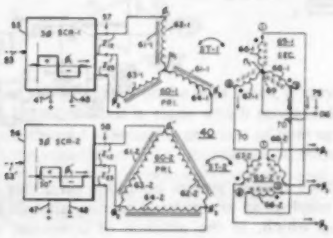
POLYPHASE POWER INVERTER SYSTEM

Dan L. Ve Nard, II, Bonners Ferry, Idaho, assignor to Gates Learjet Corporation, Wichita, Kans.

Continuation of application Ser. No. 630,061, Nov. 4, 1969, now Patent No. 3,477,010. This application Oct. 21, 1969, Ser. No. 868,190

Int. Cl. H02m *1/12, 7/52*

U.S. Cl. 321—5 **11 Claims**



Polyphase inverter system utilizing power silicon-controlled rectifiers. A plurality of polyphase square wave generators or channels are interconnected, each generator in a relative predetermined time phase displacement. Their respective outputs are herein arranged to directly provide multistepped waveforms, filtered to become the system polyphase power output. Each such waveform is composed of a significant number of steps whereby substantially reduced filtering is required. The generator channels are coupled in pairs, to respective delta and wye transformer arrangements, with their corresponding secondary windings in series-add summation, on a phase by phase basis. Reduced weight, bulk, and cost factors are significant, particularly for the summation transformers. Applicable for generating precise output frequency supply as 400-cycle polyphase aircraft installations, and for 60-cycle uninterrupted power ground stations.

3,638,095

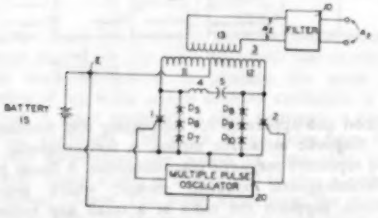
STANDBY POWER CIRCUIT UTILIZING MULTIPLE PULSE MODULATION FOR CONVERTING DC TO AC ELECTRIC POWER

Stuart P. Jackson, 1723 Grace Lane, Columbus, Ohio

Filed July 14, 1969, Ser. No. 841,365

Int. Cl. H02m *1/12, 7/52*

U.S. Cl. 321—9 A **4 Claims**



A standby power circuit of the input voltage to the converter converting direct current electric power into alternating current electric power. Specifically, the circuit utilizes a converter utilizing multiple pulse modulation of the source voltage to equal the amplitude to provide a means of varying the output fundamental voltage and reducing the higher order harmonics.

3,638,096

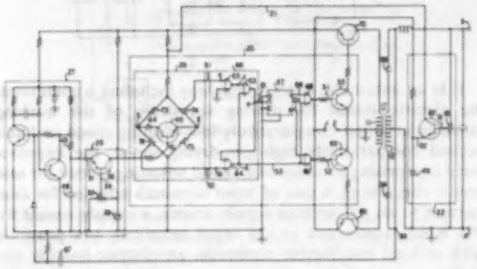
CONSTANT FREQUENCY DC TO DC CONVERTER WITH OSCILLATION SUSTAINING VOLTAGE REGULATION FEEDBACK LOOP

Frank Fuller Judd, Madison; Jan Mark Lieberman, Lake Hiawatha, and Helmut Wilhart, Whippany, all of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1970, Ser. No. 100,151

Int. Cl. H02m *1/08*

U.S. Cl. 321—19 **5 Claims**



A self-oscillating DC to DC power converter establishes oscillations in the inverter through the voltage regulating feedback circuit. Its frequency of oscillation is regulated by a frequency regulation feedback circuit which controls the hysteresis response of the voltage regulating feedback circuit.

3,638,097

ELECTRICAL INVERTER ARRANGEMENTS

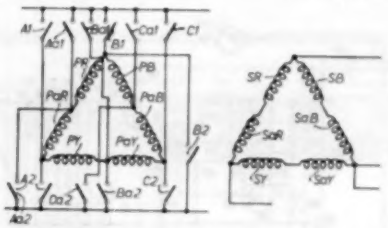
Neil S. Hardie, London, England, assignor to The Plessey Company Limited, Ilford, Essex, England

Filed June 15, 1970, Ser. No. 46,207

Claims priority, application Great Britain, June 27, 1969, 32,497/69

Int. Cl. H02m *7/48*

U.S. Cl. 321—27 **7 Claims**



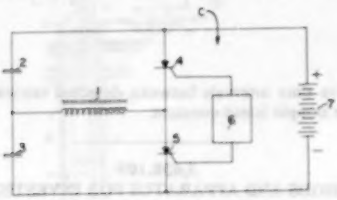
An electrical inverter arrangement comprises a polyphase transformer having a delta-connected primary winding and a delta-connected secondary winding. Positive and negative DC supply lines are provided, and the three junction points of the primary windings are connected to both supply lines through respective electronically controllable switch means. Depending on which switch means are closed, each primary winding can either have 0 volts across it, the full supply volts across it, or half of the full supply volts across it. Each stage of a multistage shift register is connected to control the setting of a respective one of the switch means, and the shift register stages are SET in such order that the resultant

operating sequence of the switches causes a substantially sinusoidal variation of voltage across each primary winding, and thus across each secondary winding.

3,638,098
INVERTER FOR GENERATING SINGLE OR MULTIPHASE CURRENT

Walter B. Guggi, Niedergiatt, Switzerland, assignor to Regus AG, Regensdorf, Switzerland

Filed Apr. 14, 1969, Ser. No. 815,598
Claims priority, application Switzerland, Apr. 19, 1968, 5852/68
Int. Cl. H02m *7/52*
U.S. Cl. 321—43 **19 Claims**

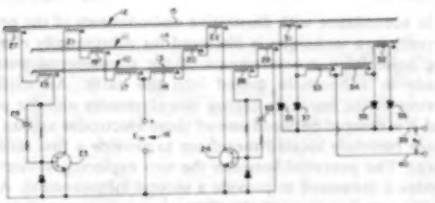


An inverter for generating single or multiphase current, comprising series networks equal to the number of phases, such networks being connected to a DC source or sources. Each said series network includes two capacitors in series connection with the common junction between the two capacitors as one load terminal which is connectable to its respective phase load. At least one electronic commutator is provided for each series network, said commutator being connected to a respective second load terminal and being switched alternately between the ends of terminals of the series network. Means are provided for triggering the commutator in sequence with and at the proper phase of the frequency of the alternating current to be generated. The inverter provides a power source for inductive current consuming appliances, particularly induction motors.

3,638,099
SELF-EXCITED INVERTER EMPLOYING COMMUTATION TIME TRANSFORMERS

John P. Centala, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Mar. 29, 1971, Ser. No. 128,749
Int. Cl. H02m *7/48*
U.S. Cl. 321—45 R **7 Claims**

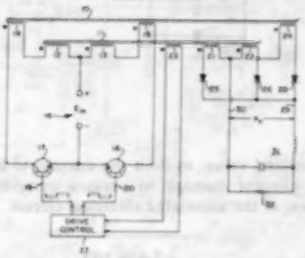


A self-excited saturating transformer inverter is provided with a pair of auxiliary commutating time transformers the windings of which are connected with those of the power transformer and with commutating diode members in circuit with the power transformer output winding in a manner that, during successive half-cycles of operation, alternate ones of the auxiliary transformers "takeover" to provide a continuing load for the driving power. High-current spike generation upon power transformer saturation is thus obviated.

3,638,100
CIRCUIT TO PREVENT A TRANSFORMER FROM PRESENTING A LOW IMPEDANCE UPON CORE SATURATION

John P. Centala, and Royce W. Lane, both of Cedar Rapids, Iowa

Filed Mar. 29, 1971, Ser. No. 128,747
Int. Cl. H02m *7/48*
U.S. Cl. 321—45 R **5 Claims**

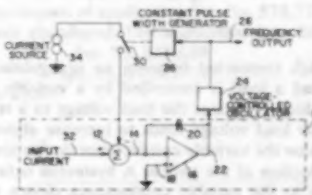


An externally driven saturating transformer inverter is provided with an auxiliary commutating transformer whose windings are connected with those of a power transformer and diode members such that upon saturation of the power transformer core, a high-reflected load impedance is presented. High-current spike generation is obviated while the regulation advantages of pulse width modulation is retained.

3,638,101
CURRENT OR VOLTAGE-TO-FREQUENCY CONVERTER USING NEGATIVE FEEDBACK

Eric R. Fahnoe, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 24, 1970, Ser. No. 49,305
Int. Cl. H02m *5/00*
U.S. Cl. 321—60 **11 Claims**



A current or voltage-to-frequency converter is provided for converting a DC current or voltage to a proportionate frequency of electrical pulses of predetermined width. The converter includes an integrator coupled to control the frequency of a voltage-controlled oscillator, and negative feedback is provided to the input of the integrator during the occurrence of pulses from the oscillator to provide high linearity and stability.

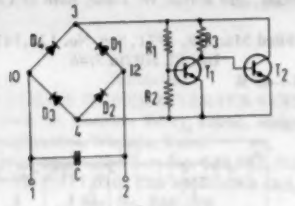
3,638,102
OVERLOAD PROTECTION CIRCUIT

Horst Pelka, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of application Ser. No. 679,437, Oct. 31, 1967, now abandoned. This application Aug. 26, 1970, Ser. No. 67,240
Claims priority, application Germany, Nov. 4, 1966, S 106853
Int. Cl. G05f *1/44*
U.S. Cl. 323—9 **8 Claims**

An overload protection circuit employing a transistor circuit responsive to bipolar direct current signals to prevent

damage to overloaded electrical circuits. The transistor circuit is responsive to instantaneous current amplitudes in the associated electrical circuit to be protected greater than a predetermined value, to limit the current to a safe value, to thereby prevent damage to various components, such as transistors, of the associated electrical circuit.

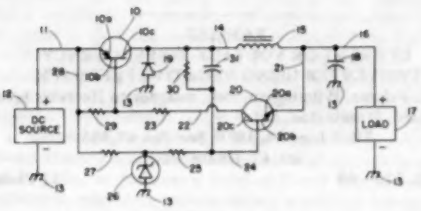


3,638,103

SWITCHING REGULATOR

Arthur G. Birchenough, Brookpark, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 3, 1970, Ser. No. 86,548
Int. Cl. G05f 1/56
U.S. Cl. 323—22 T **11 Claims**



A switch connected between an unregulated DC power source and a load is controlled by a variable conductance device which compares the load voltage to a reference voltage. If the load voltage tends to increase above a predetermined value the variable conductance device tends to reduce the conduction of the switch. A hysteresis network provides feedback to the variable conductance device to produce a cumulative action so that the switch will turn off rapidly when the variable conductance device tends to reduce the conduction of the switch, and similarly, will turn on rapidly when the variable conductance device increases the conduction of the switch.

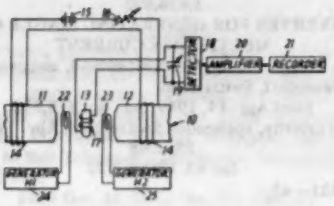
3,638,104

METHODS AND APPARATUS FOR EXAMINATION AND MEASUREMENT BY MEANS OF NUCLEAR MAGNETIC RESONANCE PHENOMENA

Reginald Graham Wright, Newport Pagnell, England, assignor to Newport Instruments Limited, Newport, Pagnell, England

Filed June 2, 1969, Ser. No. 829,679
Claims priority, application Great Britain, June 7, 1968, 27,200/68
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 **13 Claims**

In nuclear magnetic resonance apparatus a sample under test is subjected to a first unidirectional magnetic field and to a second alternating magnetic field perpendicular to said first magnetic field, and the field strength of said first magnetic field and/or the alternation frequency of said second magnetic field is modulated in such manner that the sum of two successive time intervals between detected resonance pulses from the sample is not constant.

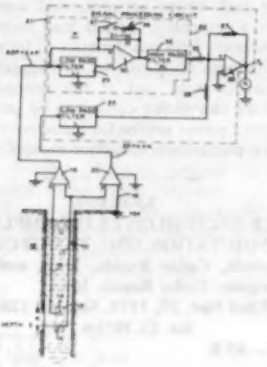


3,638,105

METHODS AND APPARATUS FOR INVESTIGATING THE SPONTANEOUS POTENTIAL OF EARTH FORMATIONS

Nick A. Schuster, Darien, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 3, 1969, Ser. No. 881,793
Int. Cl. G01v 3/18
U.S. Cl. 324—1 **32 Claims**



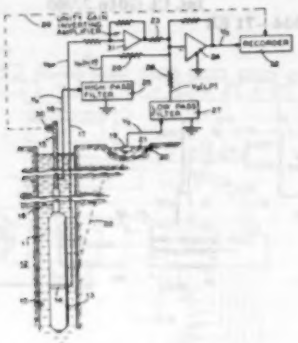
In accordance with illustrative embodiments of the present invention, a technique is disclosed for substantially eliminating noise from measurements of the spontaneous potential made in a borehole drilled into the earth. An exploring system in the borehole carries two electrodes and the potential is measured between one of these electrodes and an electrode remotely located therefrom to provide a first measurement. The potential between the two exploring device electrodes is measured to provide a second measurement. A low-frequency function of the first measurement and a high-frequency function of the second measurement are utilized to provide a substantially error-free spontaneous potential measurement. The two electrodes carried through the borehole can comprise the armor of a cable which supports a well tool in the borehole and an electrode mounted on the well tool. Alternatively, these two electrodes can take the form of two closely spaced electrodes on the well tool so as to give a differential or gradient-type measurement. This gradient measurement could also be obtained by measuring the naturally occurring current flow in the borehole.

3,638,106

METHOD AND APPARATUS FOR INVESTIGATING THE SPONTANEOUS POTENTIAL OF EARTH FORMATIONS

Milton E. Cram, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 3, 1969, Ser. No. 881,794
Int. Cl. G01v *3/18*
U.S. Cl. 324—1 **12 Claims**



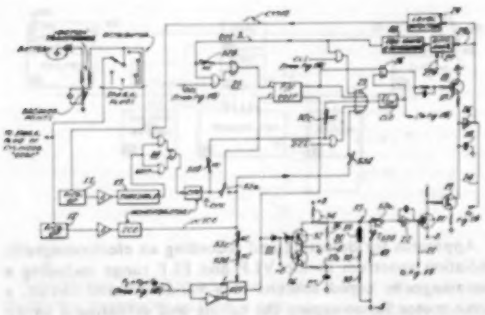
In accordance with illustrative embodiments of the present invention, methods and apparatus are disclosed for obtaining a relatively noiseless measure of the spontaneous potential of earth formations surrounding a borehole. More particularly, the naturally occurring potentials on an electrode carried by a well tool on the end of a cable, on an electrode located at the surface of the earth, and on the armor of the supporting cable are measured. The potential measured on the well tool electrode is referenced to the potential measured on the armor at high frequencies and to the potential measured on the surface located electrode at low frequencies to provide an output signal which is representative of the formation spontaneous potential.

3,638,107

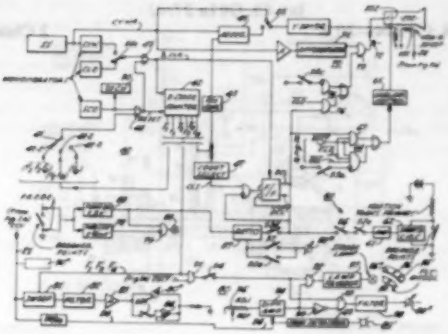
SYSTEM FOR DISPLAYING THE CHARACTERISTICS OF IGNITION SIGNALS IN AN INTERNAL COMBUSTION ENGINE

Edmond R. Pelta, Pacific Palisades, and Kenneth Stewart Gold, Canoga Park, both of Calif., assignors to Autoscan, Inc., Culver City, Calif.

Original application June 10, 1966, Ser. No. 556,710, now Patent No. 3,603,879, dated Sept. 7, 1971. Divided and this application May 15, 1970, Ser. No. 37,604
Int. Cl. G01m *15/00*
U.S. Cl. 324—15 **41 Claims**



A system is provided for displaying ignition signals of an internal combustion engine. In one mode, sweep signals are produced in synchronism with the particular recurring characteristics of the ignition signals for the different signals in an internal combustion engine. In a second mode, sweep signals are produced in synchronism with the particular recurring characteristics of such ignition signals until the occurrence of the ignition signal prior to a particular ignition signal which is to be displayed. At such a time a sweep is initiated prior to the occurrence of the particular ignition signal. This sweep is maintained until a time after the occurrence of the particular ignition signal. The particular ignition signal is displayed during this sweep.

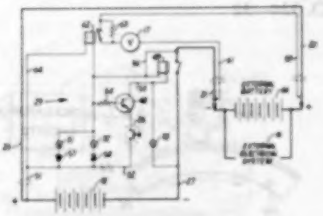


3,638,108

METHOD OF TESTING AN AUTOMOBILE BATTERY AND ELECTRICAL SYSTEM WHILE IN CIRCUIT, USING A BOOSTER BATTERY

Harry M. Channing, Reading, Pa., assignor to General Battery and Ceramic Corp., Reading, Pa.

Continuation-in-part of application Ser. No. 578,727, Sept. 12, 1966, now abandoned. This application Apr. 28, 1969, Ser. No. 819,650
Int. Cl. G01n *27/42*
U.S. Cl. 324—29.5 **5 Claims**

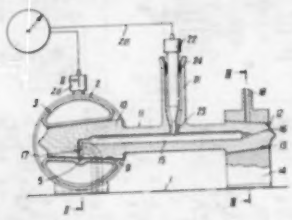


A combination booster and automobile electrical system tester, including a booster battery, polarity protector, voltmeter, remote control switch, operational indicator lights and interconnecting cables all mounted on a handtruck-type cart with a detachable handle, for making comparison tests of the voltages present in an automobile electrical system with and without the starter cranking and with and without the booster battery connected.

3,638,109
DEVICE FOR THE DETERMINATION OF THE PH VALUE OF A BLOOD TEST SAMPLE

Karl Harnoncourt, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Apr. 22, 1969, Ser. No. 818,287
Claims priority, application Austria, Apr. 30, 1968, A 4208/68
Int. Cl. G01n 27/42
U.S. Cl. 324—30 R 2 Claims

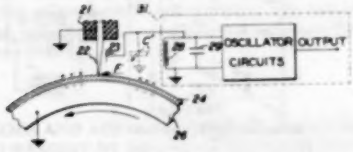


A measuring instrument for the determination of the pH value of a blood test sample including a three-way valve wherein its switch body comprises an electrolyte chamber into which the measurement-sensitive extremity of a reference electrode protrudes, the chamber having an inlet and an outlet in which the outlet is closed in a first end position of the switch body, each inlet and outlet communicating with a corresponding inlet and outlet port for the electrolyte in an intermediate position whereas, in a second end position of the switch body the inlet is closed and the outlet communicates with an aperture provided on the side of a measuring capillary.

3,638,110
DEVICE FOR MEASURING CHARGE ON A MATERIAL BY CONVERTING INTO ELECTRICAL SIGNALS THE FRICTIONAL FORCES CAUSED BY THE CHARGE

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 26, 1969, Ser. No. 802,370
Int. Cl. G01r 29/12, 5/28
U.S. Cl. 324—32 5 Claims

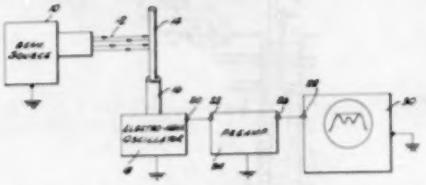


A transducer applying the Johnsen-Rahbek effect wherein the frictional force between two electrodes separated by electrostatically chargeable material is augmented by an increase in potential applied to the electrodes. The transducer measures or reads out the potential or charge patterns on the electrostatically chargeable material which may be a semiconductor, dielectric or other charge carrying surface and converts the force variations into electrical signals.

3,638,111
APPARATUS FOR MEASURING ION OR ELECTRON BEAM WIDTH BY MONITORING SECONDARY EMISSION FROM A MOVING PROBE

Robert M. Ennis, Jr., Oakridge, Tenn., and Robert G. Wilson, Canoga Park, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 29, 1970, Ser. No. 33,017
Int. Cl. G01n 27/00
U.S. Cl. 324—71 EB 13 Claims

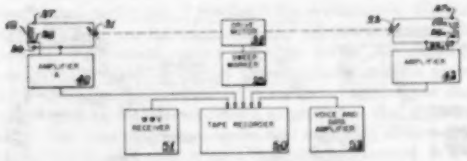


A device for measuring and displaying selected characteristics (i.e., the intensity profile distribution, the shape and the width) of molecular and/or submolecular particle beams, such as ion or electron beams, in which the beam width may be of the order of 5 microns or less, is disclosed. The device comprises a thin wire (at least 10 mils in diameter) having a very narrow zone such as a thin groove (less than 5 microns wide) along a portion of its length. When there is relative movement between the beam and the wire so that the grooved portion of the wire is passed transversely through the beam, a secondary charged particle emission current dependent upon the beam intensity and angle of incidence with the wire surface is generated and displayed on an oscilloscope as a beam intensity profile. The width of the beam is a function of the width of that portion of the profile resulting from movement of the groove across the beam.

3,638,112
VLF AND ELF SPECTROMETER

James A. Lasater, and David D. Woodbridge, both of Dallas, Tex., assignors to International Space Corporation

Filed July 26, 1963, Ser. No. 297,803
Int. Cl. G01r 23/18; H01q 7/08
U.S. Cl. 324—77 9 Claims



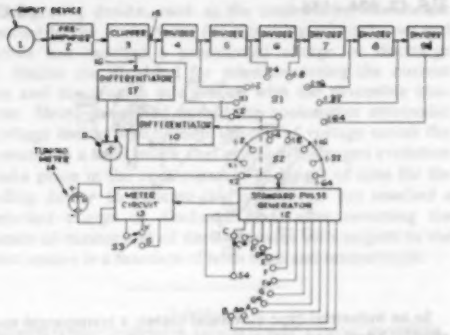
Apparatus for detecting and recording an electromagnetic radiation spectrum in the VLF and ELF range including a ferromagnetic cored antenna in a variably tuned circuit, a drive motor for sweeping the tuning and actuating a sweep marker, a time reference, and a voice and data amplifier. The output signals of these devices are fed into a multichannel recorder. A plurality of such variably tuned circuits may be used.

3,638,113

ELECTRONIC FREQUENCY-TUNING MECHANISM

Robert M. Glorioso, 19 Mass Lane, Amherst, Mass., and H. Craig Brooks, 83 Sagamore Ave., Oceanport, N.J.

Filed Mar. 4, 1970, Ser. No. 16,089
Int. Cl. G01r 23/02
U.S. Cl. 324—78 E 4 Claims



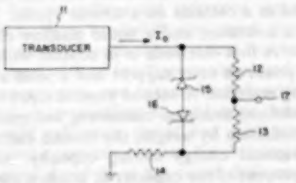
This invention is concerned with an electronic mechanism for tuning musical instruments and other frequency-generating devices, by means of a meter eliminating the necessity of a trained human ear. The mechanism provides means for feeding the input signal to a preamplifier; feeding the amplified signal to a clipper; feeding the output of the clipper to both a divider and to a differentiator; thence, to a selector switch which may be used to divide or multiply the frequency of the signal by powers of two. The signal is then fed to a standard pulse generator and from there to a meter circuit which may be of the D'Arsonval-type. The readings on the meter will indicate to the operator to what extent the frequency of the musical instrument is tuned since the mechanism is already calibrated in accordance with the position of the selector switch to a specific frequency.

3,638,114

SPLIT RANGE TRANSDUCER

Tom D. Finley, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1969, Ser. No. 889,375
Int. Cl. G01r 15/08, 15/10
U.S. Cl. 324—115 2 Claims



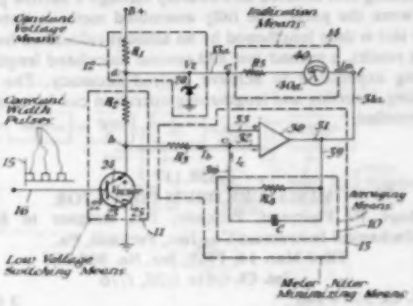
A nonlinear circuit connected to the output of a current-producing transducer to form a split range transducer. In the range where most of the data to be measured is expected, the resolution is high and in the other range the resolution is lower.

3,638,115

RATE PARAMETER INDICATOR HAVING METER MOVEMENT SMOOTHING AT LOW RATES

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Nov. 25, 1969, Ser. No. 879,716
Int. Cl. G01r 1/14
U.S. Cl. 324—125 7 Claims



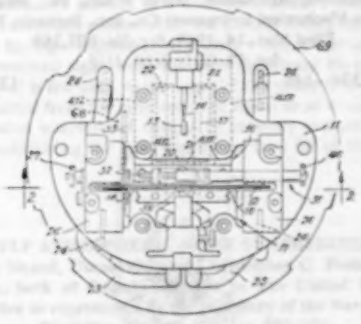
This disclosure relates to a rate parameter indicator which uniquely allows extremely accurate measuring and indicating of a rate parameter at low rates due to provision of a smooth linear signal to an indication meter circuit. The system incorporates a low-voltage drift switching circuit which is coupled to a constant reference voltage source and receptive to constant-width pulses, the frequency of which is proportional to a rate parameter. A meter jitter minimizing circuit is electrically coupled to the low-voltage drift switching circuitry, as well as the constant voltage source, and includes an averaging circuit which allows the meter jitter minimizing means to provide the aforementioned smooth linear signal to the indication meter circuit in a unique manner.

3,638,116

WATT-HOUR METERS WITH PHASING PLATE PHASED AFTER METER COMPLETION

Hugo J. A. Hess, Steinhusen, Switzerland; James W. Milligan, and Harvey L. Friend, both of Lafayette, Ind., assignors to Duncan Electric Company, Inc., Lafayette, Ind.

Filed Sept. 26, 1969, Ser. No. 870,658
Int. Cl. G01r 11/02, 35/04
U.S. Cl. 324—138 5 Claims



The phasing of electricity meters (watt-hour meters) i.e., producing the proper phase relationship between its two interacting alternating magnetic fields, is performed by a punching operation after the meter is fully assembled. A lag

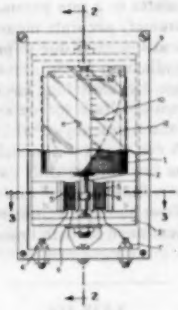
plate in the form of a conductive loop which surrounds the central pole of the voltage magnet is provided with a tail into the base of which extends a slot opening from the opening of the loop. The slot can be extended outwardly from the loop by successive nibbles of a punch to increase the length of the current path around the loop: This increases the resistance and decreases the current and the lag effect. This slotted tail is now so positioned (and bent upwardly) as to be accessible from the top of the fully assembled meter, using a slim punching tool inserted downwardly through a narrow passage between the parts. The fully assembled meter is tested and the slot is then lengthened by an amount calculated from the test results, a second test and second calculated lengthening being expectable to achieve desired accuracy. The entire testing, inserting and lengthening operation can be computer-controlled.

3,638,117

MINIATURE DRUM INDICATOR

Hobart H. Fleetman, Perkasie, Pa., assignor to Electro-Mechanical Instrument Co., Inc., Perkasie, Pa.

Filed Mar. 14, 1969, Ser. No. 807,267
Int. Cl. G01r *1/20, 1/16*
U.S. Cl. 324—146 **3 Claims**



In an electrical meter, the indicator includes a drum driven by a moving-magnet-type meter movement. A helical pattern on the drum moves relative to a flat scale to represent the value of an applied electrical signal.

3,638,118

DRUM INDICATOR

Elbert Kennedy Mackenzie, North Wales, Pa., assignor to Electro-Mechanical Instrument Co., Inc., Perkasie, Pa.

Filed Mar. 14, 1969, Ser. No. 807,268
Int. Cl. G01r *1/20, 1/16*
U.S. Cl. 324—146 **12 Claims**

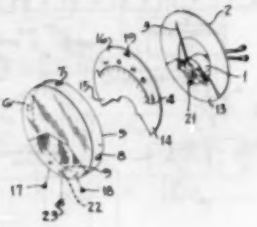
In an electrical meter, the indicator includes a drum constructed of a low-density material to reduce the rotational inertia of the drum. The drum is mechanically coupled for rotation by an armature so that indicia on the drum represent the value of an applied electrical signal in accordance with the relative rotation of the drum.

3,638,119

INDEX MOUNTINGS FOR ELECTRICAL METERS

Elbert K. Mackenzie, North Wales, Pa., assignor to Electro-Mechanical Instrument Co., Inc., Perkasie, Pa.

Filed June 13, 1969, Ser. No. 832,924
Int. Cl. G01r *1/04, 1/08*
U.S. Cl. 324—156 **8 Claims**



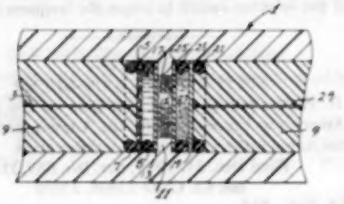
In an industrial-type electrical meter, a transparent molded plastic bezel has molded index grooves in the periphery thereof so that the meter can be mounted in an indexed bracket in one of several mounting positions without use of tools. One embodiment of the meter has an interchangeable dial. Another embodiment of the meter has a weatherproof seal. Still another embodiment can be easily installed in an explosionproof case.

3,638,120

COULOMETER AND TIMING APPARATUS

Ernest M. Jost, Plainville, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1969, Ser. No. 885,785
Int. Cl. G04f *9/00*; G01r *19/00*
U.S. Cl. 324—182 **16 Claims**



A reversible coulometer includes a pair of electrodes wherein each electrode alternates between functioning as an anode and as a cathode on alternate cycles. The coulometer includes a container and a liquid alkaline electrolyte in the container. A first electrode is in contact with the electrolyte and comprises an inert support and a solid active cadmium-containing material. A second control electrode comprises a liquid cadmium amalgam containing not more than about 1 percent cadmium by weight, the second electrode having an electrochemical energy storing capacity corresponding to about 1 percent of the capacity of the first electrode. A layer of dielectric material, permeable by the electrolyte and impermeable by the amalgam is in contact with the electrolyte and the amalgam to separate the electrodes. Means are provided for reversibly connecting the two electrodes in alternate sequence in a circuit which is connected to a source of current. During operation of the coulometer, the second electrode is alternately converted to substantially fully charged (reduced) and discharged (oxidized) conditions.

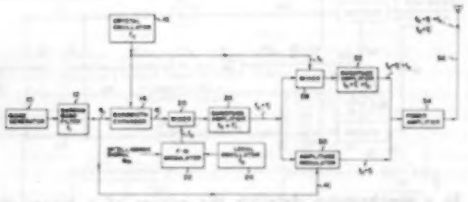
The liquid amalgam maintains a supply of available, electrochemically active cadmium material at the liquid surface of the electrode on each anodic and cathodic cycle for the second electrode. The relatively small capacity of the second electrode relative to the first electrode then cooperates with the liquid surface characteristic of the second electrode so that the relative surface areas of the electrodes and the current density therebetween are maintained substantially constant from cycle to cycle. Also disclosed is electrical timing apparatus comprising the source of current, a resistor having a resistance which is a function of its temperature, and a current integrating device, such as the coulometer. Means are connected to the coulometer for signalling when the second electrode has reached a preselected charge or discharge level. Means are provided for interconnecting the current source and the resistor in a circuit with the reversible coulometer. Shunt-connected across the coulometer electrodes is a voltage limiter which limits the rise of voltage across the coulometer to a level below that at which hydrogen evolution will take place in the coulometer. The length of time for the signalling device to indicate the coulometer has reached a preselected charge or discharge level after reversing the sequence of connection of the electrodes with respect to the current source is a function of both time and temperature.

3,638,121

NONPERIODIC ENERGY COMMUNICATION SYSTEM CAPABLE OF OPERATING AT LOW SIGNAL-TO-NOISE RATIOS

James J. Spilker, Jr., Palo Alto, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 20, 1960, Ser. No. 77,241
Int. Cl. H04k *1/00*
U.S. Cl. 325—32 **9 Claims**



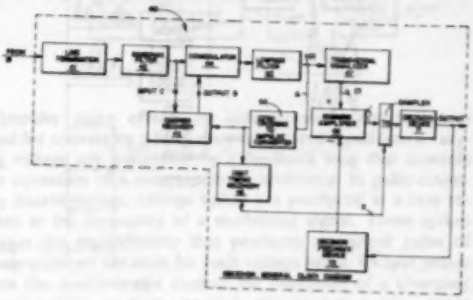
1. An intelligence communication system comprising a transmitter and a receiver, said transmitter comprising means for obtaining a narrow band reference signal, bandwidth expansion means for expanding said reference signal into a wide band signal having a bandwidth very much greater than the bandwidth of said reference signal, means for modulating said wide band signal with an intelligence signal and said narrow band reference signal, and means for delivering to said receiver a signal corresponding to said wide band signal modulated by said reference signal and said intelligence signal; said receiver comprising means for deriving said narrow band reference signal from the signal delivered to said receiver from said transmitter, bandwidth expansion means for expanding the derived reference signal into a wide band signal substantially identical to the wide band signal produced by said bandwidth expansion means in said transmitter, and means for comparing the signal delivered to said receiver from said transmitter with the wide band signal from said bandwidth expansion means in said receiver to recover said intelligence signal.

3,638,122

HIGH-SPEED DIGITAL TRANSMISSION SYSTEM

Earl D. Gibson, Huntington Beach, Calif., assignor to North American Rockwell Corporation

Filed Feb. 11, 1970, Ser. No. 10,332
Int. Cl. H04b *1/10*
U.S. Cl. 325—42 **12 Claims**



The apparatus of the present invention allows for digital data communications in the presence of intersymbol interference. A transmitter means transforms bits of digital data into a modulated analog signal for transmission over a transmission channel such as a voice-grade telephone line. A receiver for receiving the transmitted signal is comprised in part of a demodulating means for demodulating the analog signal. The demodulated signal is fed to a transversal equalizer which is a time domain network comprising a multiple tapped delay line, an adjustable attenuator connected to each delay line tap, and a summer circuit for combining the attenuated outputs of all taps into a single coordinated signal. A summer means receives the coordinated output signal from the transversal equalizer. Means are provided for sampling the output signal from the summer means at the data rate to provide a binary signal proportional to the summer means' output signal. Decision means determine the polarity and/or amplitude of the binary signal and provide a second binary signal indicative thereof to a decision feedback means. The decision feedback means form the second binary signals into a signal having weighted components which are proportional to the received signal with the most significant bit removed. This signal is fed back to the input of the summer means and is subtracted from the later received signal so as to cancel the intersymbol interference caused by recently evaluated digits while maintaining the most significant data bit as the output signal.

3,638,123

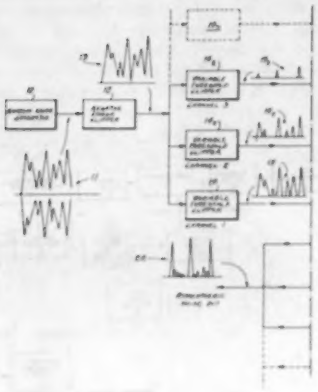
VLF ATMOSPHERIC NOISE SYNTHESIZER

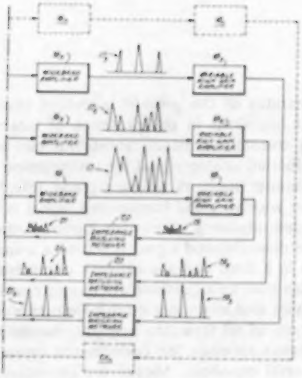
L. John Sicard, Uncasville, and Christopher G. Foster, Gales Ferry, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 1, 1969, Ser. No. 880,456
Int. Cl. H03b *29/00*
U.S. Cl. 325—132 **4 Claims**

The output of a random noise generator is applied to a negative image clipper whose clipped output is simultaneously applied to at least three separate channels, each channel having in tandem arrangement a variable threshold

clipper, a wideband amplifier, a variable high-gain amplifier, and an impedance matching network. The outputs of the





matching networks are combined to provide selective atmospheric noise.

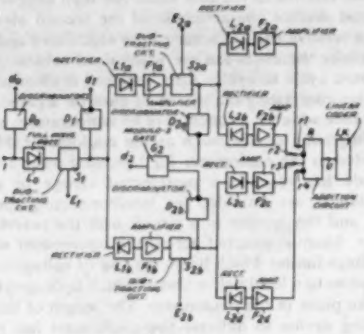
3,638,124

APPARATUS UTILIZING A TREE NETWORK FOR COMPANDING AND CODING AN ANALOG SIGNAL IN A PCM SYSTEM

Stig Gustaf Lindqvist, Enskede, and Ilmar Valfeid Vaher, Bandhagen, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 30, 1968, Ser. No. 787,957
Claims priority, application Sweden, Jan. 18, 1968, 662/68
Int. Cl. H04b *1/00*
U.S. Cl. 325—141 **3 Claims**

An arrangement for companding an analog signal in a pulse code modulation system, comprising a tree network having one input and a number of outputs each corresponding to a subrange of the amplitude range within which the analog signal falls. The branches of the tree network comprise amplifiers having different amplification, by means of which signals belonging to different subranges are given different amplification. The outputs of the tree network are connected to an addition circuit at the output of which an analog companded signal is obtained. The arrangement is also provided with digital outputs from which a digital value



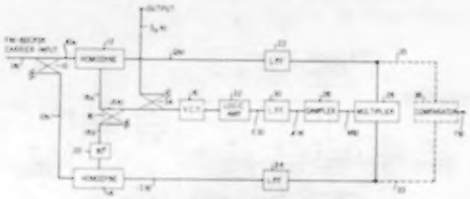
corresponding to the subrange of the analog signal is obtained.

3,638,125

APPARATUS AND METHOD FOR THE SYNCHRONOUS DETECTION OF A DIFFERENTIALLY PHASE MODULATED SIGNAL

James E. Goell, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 26, 1969, Ser. No. 879,992
Int. Cl. H04b *1/30*
U.S. Cl. 325—320 **18 Claims**



In a synchronous detector the carrier of a binary differentially coherent phase shift-keyed signal is recovered by decomposing the carrier information signal into its conjugate in-phase and out-of-phase components which contain in their arguments a term $\delta(t)$ representing the phase difference between the carrier and a local oscillator signal. The conjugate components are multiplied to generate a product signal which is sampled every other time slot to produce an error signal proportional to $\sin[2\delta(t)]$. This signal is applied to the local oscillator to phase lock the local oscillator signal to the carrier of the information signal.

3,638,126

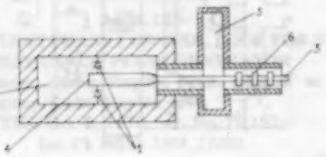
HIGH-FREQUENCY CONVERTER

George Ctirad Spacek, 967 La Senda Road, Santa Barbara, Calif.

Filed Aug. 21, 1969, Ser. No. 851,923
Int. Cl. H03d *7/02*
U.S. Cl. 325—446 **7 Claims**

This invention relates to a balanced high-frequency converter for mixing of microwave signals over large bandwidth. The essential characteristics of this invention is the placement of a pair of semiconductor diodes at the intersection of a waveguide with one coaxial line in such manner that the broad walls of the waveguide are utilized as the continuation

of the outer conductor of the coaxial line. Thus the waveguide does not cause an impedance mismatch for signals propagating on the coaxial line, allowing coupling of wide-band signals into the diodes. The resulting beat frequency signal is extracted through the waveguide. An extension of the above principle allows the construction of a doubly balanced frequency converter, in which two pairs of



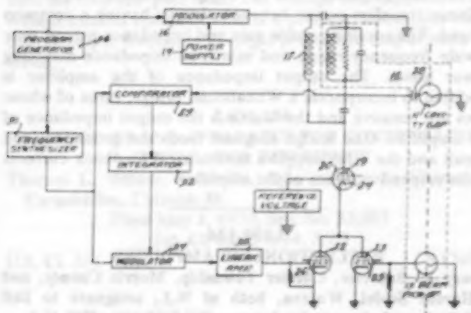
semiconductor diodes are placed across the waveguide and in which one coaxial line couples signals to one pair of diodes and a second coaxial line couples signals to the second pair of diodes. The broad walls of the waveguide are utilized as continuation of the outer conductors of the coaxial lines, thereby eliminating impedance mismatch and allowing efficient frequency conversion over a broad frequency range.

3,638,127

STABILIZATION SYSTEM FOR RESONANT CAVITY EXCITATION

Quentin A. Kerns, Glen Ellyn, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 29, 1970, Ser. No. 6,874
Int. Cl. H01j *29/52*
U.S. Cl. 328—227 **5 Claims**



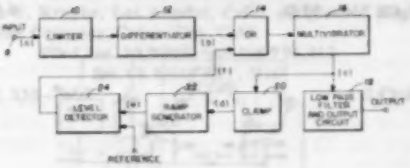
A stabilization system for resonant cavity excitation of a particle accelerator or particle storage ring includes a pair of cavity current control tubes coupled in parallel. One tube is coupled to a beam pickup in the accelerator to provide a cavity current which is a function of the beam intensity. The current through the other tube is controlled by a comparison between the voltage across the accelerating gap and a desired voltage. The currents through each of the pair of tubes are combined to provide excitation for the cavity. Each of the pair of tubes may consist of a number of tubes in parallel. The cavity is constructed so that energy at undesired frequencies is absorbed.

3,638,128

PULSE DISCRIMINATOR

Robert F. Downs, Santa Ana, Calif., assignor to Advanced Technology Center, Inc., Grand Prairie, Tex.

Filed Dec. 22, 1969, Ser. No. 886,834
Int. Cl. H03d *3/04*
U.S. Cl. 329—126 **13 Claims**



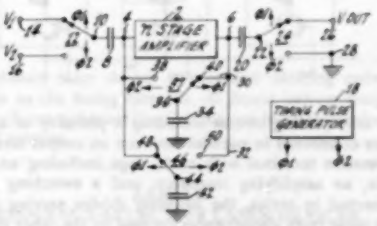
Impulse noise effects on pulse-counting discriminators used for converting a frequency-modulated signal into a varying voltage are minimized by a feedback loop that controls the operation of a monostable multivibrator. In pulse-counting discriminators, voltage spikes are produced at a rate related to the frequency of a modulated signal. These spikes trigger the multivibrator that produces an output pulse of predetermined duration for each voltage spike. Output pulses from the multivibrator control the operation of a clamping circuit which, in turn, controls the operation of a ramp generator. A level detector compares the output of the ramp generator to a reference voltage signal and generates a voltage spike when the instantaneous value of the ramp generator output equals the reference signal. This voltage spike also connected to the multivibrator and triggers it to synthesize an output pulse. Operation of the clamping circuit, ramp generator and level detector in conjunction with the multivibrator synthesize an output pulse when one should appear. If the voltage spikes that trigger the multivibrator occur at a frequency in excess of an upper established limit, a second level detector compares the ramp generator output to a second reference signal. This second level detector generates a control signal to inhibit trigger pulses to the monostable multivibrator.

3,638,129

CHOPPER STABILIZED AMPLIFIER

Richard Lee Pryor, Cherry Hill, N.J., assignor to RCA Corporation

Filed May 7, 1970, Ser. No. 35,395
Int. Cl. H03f *3/38*
U.S. Cl. 330—9 **9 Claims**

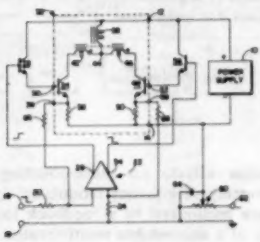


Successive levels of a chopped direct voltage input signal are applied to an amplifier during succeeding time intervals. During each such interval a portion of the output signal produced by the amplifier is stored and during each following interval, the stored signal is fed back as an input to the amplifier for stabilizing the voltage reference level at the input terminal.

3,638,130
HIGH-SPEED AMPLIFIER FOR DRIVING AN INDUCTIVE LOAD

John C. Freeborn, West Covina, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of application Ser. No. 707,274, Feb. 21, 1968. This application June 8, 1970, Ser. No. 48,798
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 6 Claims

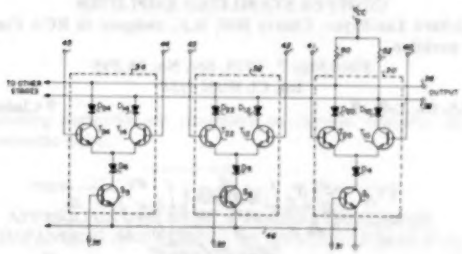


A high-speed amplifier for use with a center tapped inductive winding such as found in the deflection coils of a CRT. The amplifier employs an inductive energy storage coil and means for differentially limiting the currents permitted to flow from the coil into opposite ends of the winding, whereby rapidly decreasing current flow through one end of the winding causes rapid increase in current flow through the other end of the winding as a result of back EMF generated by the coil.

3,638,131
MULTIPLEXING CIRCUIT WITH STAGE ISOLATION MEANS

Vahe Sarkissian, Sunnyvalle, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Sept. 29, 1969, Ser. No. 861,867
Int. Cl. H03f 3/68
U.S. Cl. 330—30 R 7 Claims



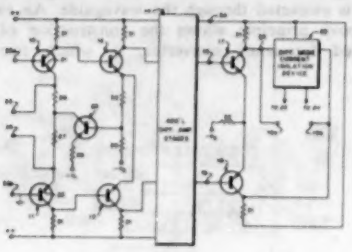
A multiplexing circuit including a plurality of amplifying stages connected in parallel between an output terminal and a common terminal with each stage including an isolating diode, an amplifying transistor, and a switching transistor connected in series, the isolating diodes serving to isolate each stage from disturbances created by the other stages.

3,638,132
DIFFERENTIAL AMPLIFIER

Theodore R. Trilling, Berkshire Road, R.D. #3, Doylestown, Pa.

Filed Apr. 10, 1968, Ser. No. 720,177
Int. Cl. H03f 1/00
U.S. Cl. 330—69 2 Claims

A direct-coupled cascaded differential amplifier having a current isolation stage connected at the common mode point in the emitter circuit of the first differential pair and a differential mode current isolation device connected with either

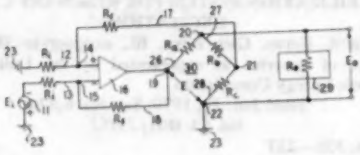


a double-ended or single-ended output circuit to couple negative series differential feedback to the emitter circuit of the first differential pair.

3,638,133
FEEDBACK AMPLIFIER WITH BRIDGE-STABILIZED OUTPUT IMPEDANCE

Stanley Thayer Meyers, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 10, 1970, Ser. No. 27,269
Int. Cl. H03f 1/36
U.S. Cl. 330—104 8 Claims

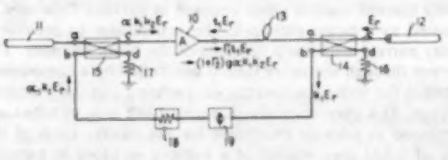


An impedance-matching arrangement comprising an operational amplifier with a bridge-stabilized output impedance transfers power between circuits having a common ground. The resulting stable gain and impedance extend over a wide frequency range and minimize impedance-matching power losses. The output impedance of the amplifier is modified to incorporate a Wheatstone bridge, three of whose arms are resistive and the fourth is the output impedance of the amplifier. One bridge diagonal feeds the grounded load circuit and the other supplies symmetrical feedback currents to the respective inputs of the amplifier.

3,638,134
REFLECTIONLESS AMPLIFIER

Henry R. Beurrier, Chester Township, Morris County, and Harold Seidel, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 26, 1969, Ser. No. 880,016
Int. Cl. H03f 1/26
U.S. Cl. 330—149 11 Claims



An impedance match at the external terminals of an amplifier are simulated by cancelling any component of the signal

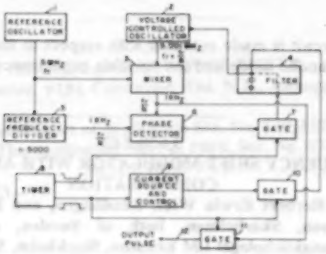
wave reflected by the amplifier. At the input terminal of the amplifier, the cancelling wave is obtained by sampling the amplified signal and directionally coupling a portion thereof into the amplifier input network in a direction away from the amplifier. At the amplifier output terminal, the cancelling wave is obtained by sampling any wave reflected back towards the amplifier, and injecting a portion of this wave into the input end of the amplifier.

3,638,135

INTERMITTENT PHASE CONTROL LOOP FOR SWEPT FREQUENCY PULSE GENERATOR

Harris A. Stover, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Oct. 8, 1970, Ser. No. 79,153
Int. Cl. H03b *3/04, 23/00*
U.S. Cl. 331—14 **8 Claims**



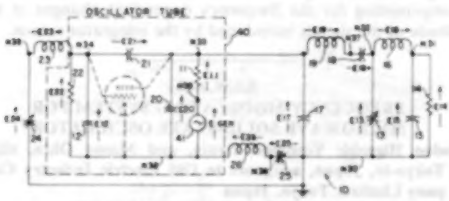
A means for generating pulses with precise time-frequency variation embodies a phase locked loop including a precise reference frequency source and a voltage controlled oscillator by means of which an output frequency may be generated precisely in phase and equal in frequency with respect to the precise reference. Control means including a current source the magnitude of which is a predetermined time varying characteristic determines the variation of output frequency from the initial loop controlled value by supplying current, after loop reference disablement, to a capacitor associated with the loop low-pass filter. The voltage thus supplied to the voltage control oscillator effects a predetermined time variation of output frequency during a prescribed output pulse interval.

3,638,136

METHOD OF AND APPARATUS FOR CONTROLLING OSCILLATOR EFFICIENCY

Thomas L. Wilson, Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.

Filed May 1, 1970, Ser. No. 33,801
Int. Cl. H03b *3/14, 5/10*
U.S. Cl. 331—74 **8 Claims**



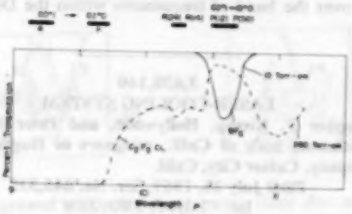
The efficiency of a high-frequency power source is maximized by proper selection of the power oscillator tube filament bypass capacitor. By selecting the proper value for this bypass capacitor, reactive components of the oscillator tube plate current are eliminated and the oscillator tube plate dissipation is minimized. The value of this capacitor can be varied over a fairly wide range without producing any significant percentage change in the frequency at which the power source operates.

3,638,137

METHOD OF Q-SWITCHING AND MODE LOCKING A LASER BEAM AND STRUCTURE

William F. Krupke, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 10, 1969, Ser. No. 791,212
Int. Cl. H01s *3/11, 3/10*
U.S. Cl. 331—94.5 **2 Claims**



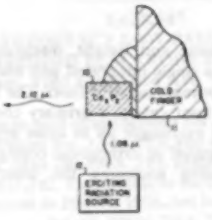
The method of passively Q-switching and mode locking a multiwavelength laser to produce repetitive pulses of coherent radiation at a specific single wavelength using a mixture of gases, and a structural arrangement therefor.

3,638,138

CADMIUM PHOSPHIDE LASER

Stephen G. Bishop, Arlington, Va.; William J. Moore, Greenbelt, Md., and Edward M. Swiggard, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 25, 1970, Ser. No. 49,705
Int. Cl. H01s *3/16*
U.S. Cl. 331—94.5 **3 Claims**



A solid-state laser device is provided utilizing cadmium phosphide as the lasing element. At liquid helium temperature it produces coherent laser oscillation having wavelengths near 2.12 micron.

3,638,139

FREQUENCY-SELECTIVE LASER DEVICES

Arthur Ashkin, Bernardsville, and Herwig Kogelnik, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, New York, N.Y.

Original application Sept. 29, 1964, Ser. No. 400,266, now Patent No. 3,403,348, dated Mar. 24, 1968. Divided and this application May 6, 1968, Ser. No. 736,895
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **8 Claims**

Because the index of refraction in a discharge gas column varies as a function of frequency and radius, light rays of dif-

ferent frequencies are diffracted different amounts as they traverse the column. By suitably locating the cavity mirrors on opposite sides of the column, a single frequency laser

oscillator is realized. By changing the location and orientation of one of the mirrors, the laser can be continuously tuned over the band of frequencies within the Doppler line width.

3,638,140

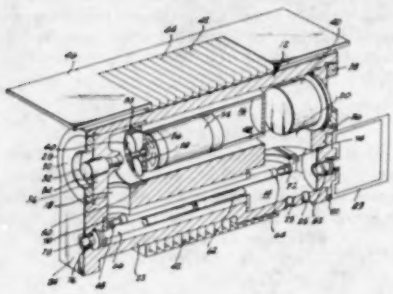
LASER-COOLING SYSTEM

Christopher F. Knapp, Hollywood, and Peter S. Ozzimo, Hawthorne, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 28, 1969, Ser. No. 845,335

Int. Cl. H01s *3/02, 3/04*

U.S. Cl. 331—94.5 **9 Claims**



A minimum volume and weight, integrated laser-cooler system comprising a single integrated unit enclosing a closed loop containing a primary coolant fluid. The loop includes a flowing coolant, a laser cavity, a primary coolant circulator and a coolant heat exchanger all in close proximity in concentric, coaxial, parallel or orthogonal configurations within a continuous housing enclosing the laser-cooler system module.

3,638,141

COMPACT, HIGH-POWER, HIGH-EFFICIENCY SILICON AVALANCHE DIODE L-BAND OSCILLATOR

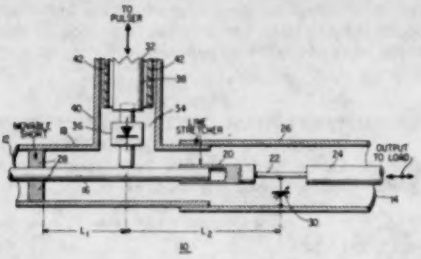
Peter Alan Levine, Hightstown, and Shing-Gong Liu, Princeton, both of N.J., assignors to RCA Corporation

Continuation of application Ser. No. 796,837, Feb. 5, 1969, now abandoned. This application Nov. 12, 1970, Ser. No. 89,129

Int. Cl. H03b *7/14*

U.S. Cl. 331—101 **9 Claims**

A compact, easily tunable, silicon avalanche diode oscillator for pulsed operation in the L-band which has an efficiency of about 40 percent, equal to that of vacuum tube oscillators operating at these frequencies, is obtained by utilizing a coaxial line composed of three serially connected sections in which the intermediate section has a characteristic impedance significantly larger than either of the other sections. One end of the coaxial line is short circuited; the avalanche diode is coupled to the coaxial line at a point between the short circuit and the beginning of the intermediate section; a variable capacitance is connected across the intermediate section at a given point thereof; and the other end of the coaxial line is connected to the output of the oscillator. The



short circuit is made movable with respect to the position of the avalanche diode and the variable capacitance is made adjustable.

3,638,142

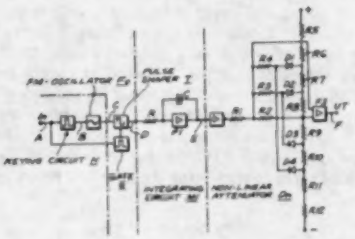
FREQUENCY SHIFT MODULATOR WITH AMPLITUDE COMPENSATION

Walter Herbert Erwin Widl, Bandhagen, and Erik Herbert Olofsson, Skarholmen, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation-in-part of application Ser. No. 672,218, Oct. 2, 1967, now abandoned. This application July 20, 1970, Ser. No. 56,362

Int. Cl. H04l *27/12*; H03c *3/04*

U.S. Cl. 332—9 **6 Claims**



A frequency modulator apparatus receives pulse signals switching between two amplitudes. The pulse signals are fed, via a modulator means which transmits square wave signals switching between two frequencies, to an integrator means. The integrator means converts the square wave signals to triangular-shaped signals which are then converted to substantially sinusoidal signals. There is also included means for compensating for the frequency dependent changes in amplitude of the signals introduced by the integrator means.

3,638,143

FREQUENCY-MODULATING SYSTEM FOR MICROWAVE SOLID-STATE OSCILLATOR

Tadao Higashi; Yoshinori Iwata, and Masae Ohta, all of Tokyo-to, Japan, assignors to Oki Electric Industry Company Limited, Tokyo, Japan

Filed Sept. 2, 1969, Ser. No. 854,642

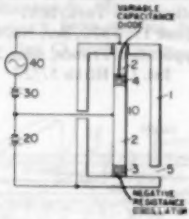
Claims priority, application Japan, Sept. 3, 1968, 43/62774

Int. Cl. H03c *3/22*

U.S. Cl. 332—30 V **8 Claims**

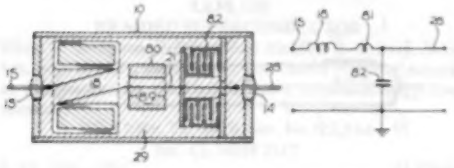
Frequency modulation is obtained by applying a modulating voltage across a variable capacitance diode which appears in the center conductor of a cavity resonator. A direct

voltage energizes a Gunn diode coupled with the resonator. Thus frequency modulation characteristics can be set ir-



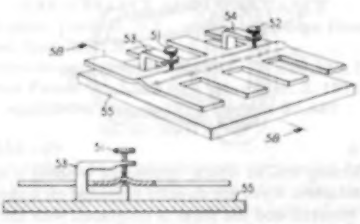
respective of the modulation voltage and current directly influencing the oscillation output.

3,638,144
BROADBAND LOW-PASS FILTER
Peter A. Denes, 9101 Crestwood Ave. N.E., Albuquerque, N. Mex.
Continuation-in-part of application Ser. No. 730,352, May 20, 1968. This application Nov. 6, 1969, Ser. No. 874,636
Int. Cl. H03h *7/14*
U.S. Cl. 333—79 **1 Claim**



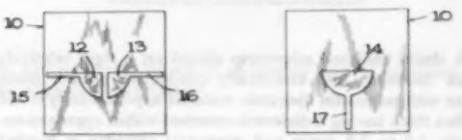
Broadband low-pass filters containing inductors and/or capacitors wherein resonances of a main inductor and/or capacitor are obviated by utilizing single-turn inductors and/or low distributed inductance capacitors which have no self resonances below 200 MHz. and whose resonances do not coincide with the self resonances of the main components. The auxiliary components are connected so as to maintain the high-insertion loss of the filter at the self-resonant frequencies of the main components.

3,638,145
ELECTROMECHANICAL WAVE FILTER
Emmanuel P. Papadakis, Acton, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 15, 1969, Ser. No. 885,050
Int. Cl. H03b *9/20*
U.S. Cl. 333—71 **3 Claims**



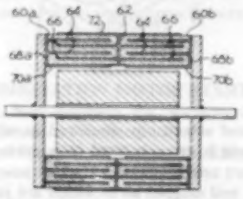
The specification described an electromechanical filter design which is an improvement over the ladder-type torsional filter of U.S. Pat. No. 3,064,213 issued to W. P. Mason on Nov. 13, 1962. Unwanted longitudinal resonances are eliminated by the use of a longitudinal reinforcing member. An improved mounting arrangement is described. It has also been found that the number of transducers necessary for effective operation of this filter can be reduced by one-half.

3,638,146
PIEZOELECTRIC CERAMIC FILTER
Tetsuo Takaku, Saitama-ken, and Meiji Miyashita, Tokyo, both of Japan, assignors to Toko, Inc., Tokyo, Japan
Filed Sept. 24, 1969, Ser. No. 860,717
Claims priority, application Japan, Sept. 25, 1968, 43/83135
Int. Cl. H03h *7/10*
U.S. Cl. 333—72 **7 Claims**



An improved piezoelectric ceramic filter for use in a frequency range above 1 MHz., which uses the thickness expansion or thickness shear mode of the vibration of a thin ceramic plate having opposed surface electrodes, and having conductor leads from the electrodes disposed at right angles. The body of the filter is a thin ceramic platelike member. A divided active electrode comprising a pair of electrode sectors each having a relatively straight marginal side is mounted on one surface of said body in a manner whereby the marginal straight sides are spaced slightly apart in parallel. A ground electrode is mounted in at least partial peripheral alignment with said active electrode, but on the opposite surface of said body, and corresponds in area size and shape to at least a major portion of that of said active electrode. The active and ground electrodes have a common overlap area which is not in excess of an area whose linear dimension in one direction is one-half that of the other direction, and said area is preferably of a semicircular shape.

3,638,147
HIGH-FREQUENCY LOW-PASS FILTER WITH EMBEDDED ELECTRODE STRUCTURE
Peter A. Denes, 9101 Crestwood Ave. N.E., Albuquerque, N. Mex.
Continuation-in-part of application Ser. No. 393,946, Sept. 2, 1971, now Patent No. 3,456,215, and a continuation-in-part of 730,352, May 20, 1968. This application June 6, 1969, Ser. No. 831,142. The portion of the term of this patent subsequent to July 15, 1986, has been disclaimed.
Int. Cl. H03h *7/14, 7/06*
U.S. Cl. 333—79 **34 Claims**



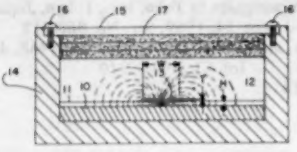
A three terminal pi filter having embedded electrodes, or a system of embedded electrodes, whereby the embedded structure of the electrodes results in a pi filter having higher insertion losses, better attenuation of unwanted signal power, greater mechanical strength and smaller dimensions than previously known filters.

3,638,148

LID INTERACTION PROTECTED SHIELD ENCLOSED DIELECTRIC MOUNTED MICROSTRIP

Ben R. Hallford, Dallas, and Carl E. Bach, Garland, both of Tex., assignors to Collins Radio Company, Dallas, Tex.

Filed June 25, 1970, Ser. No. 49,759
Int. Cl. H01p 3/08, 5/08; H04b 15/02
U.S. Cl. 333—84 M 23 Claims



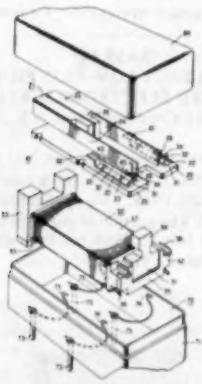
A shield enclosed microstrip circuit on a rigid relatively thick thermally and electrically conductive ground plane plate with polyolefin dielectric material approximately 0.026 inches thick having a dielectric constant within approximately the 2.3 to 2.5 range and microstrip circuitry in bonded laminate relation. RF microwave absorbent foamed material is supported within the shield enclosure in spaced generally parallel relation from the microstrip circuitry to simulate free space and eliminate "LID" effect over the microstrip circuitry.

3,638,149

VIBRATING REED SELECTOR HAVING IMPROVED COMPONENT STRUCTURE

George Ellsworth Bopp, Worthington, and Larry Lee Wiese, Pickerington, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 24, 1970, Ser. No. 101,307
Int. Cl. H01h 51/34
U.S. Cl. 335—91 10 Claims



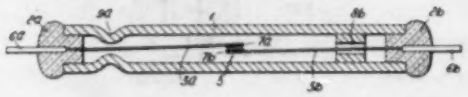
A vibrating reed selector is disclosed in which a unitary motor-contact unit is encapsulated in a protective housing. The motor-contact unit contains a contact assembly, a motor assembly and an end magnet all of which are joined in a rigid structure. The contact assembly includes a ceramic circuit board rigidly attached to the end magnet at one end, two vibrating tines which carry two moving contacts and two contact brackets which carry two fixed contacts. The motor assembly includes a coil wound bobbin and a core which extends through the bobbin and which is rigidly attached to the end magnet at one end and the circuit board at the other.

3,638,150

REED RELAY

Rene L. Zwobada, Orsay, and Andre Jean Regeffe, Villemomble, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed June 19, 1970, Ser. No. 47,719
Claims priority, application France, June 25, 1969, 6921308
Int. Cl. H01h 51/27
U.S. Cl. 335—153 6 Claims



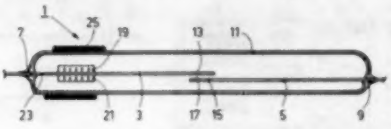
A reed relay is provided in which the sealed envelope is a tube made of magnetic material instead of glass.

3,638,151

CONTACT DEVICE

Hendrik Van der Heide, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 15, 1970, Ser. No. 72,363
Claims priority, application Netherlands, Sept. 23, 1969, 6914458
Int. Cl. H01h 51/22, 51/28
U.S. Cl. 335—153 4 Claims



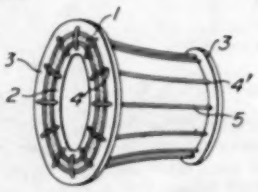
Contact device comprising an electrically conductive contact spring clamped tight at one end, whereas its freely movable end is located opposite a countercontact, and comprising an energizing coil controlling the contact spring and having its field extending in the direction of length of the contact spring, which is provided at its movable part near the clamped end with at least one permanent magnet surrounded by the energizing coil and polarized transversely of the direction of length of the contact spring.

3,638,152

DEFLECTING COILS

Takashi Tsutsumi, Suita, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed June 15, 1970, Ser. No. 46,241
Claims priority, application Japan, June 19, 1969, 44/49137
Int. Cl. H01f 5/04
U.S. Cl. 335—213 4 Claims

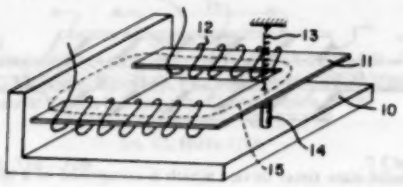


A deflecting coil in which, instead of winding a coil on a core, conductive wires are directly provided on a sheet of insulating material and the sheet is combined with the core or both the sheet of insulating material and the conductive wires are directly provided on the surface of the core, and which, therefore, is adapted to mass production possessing uniform characteristic.

3,638,153
TRANSDUCER HAVING SINGLE LAYERED MAGNETOSTRICTIVE MEMBER

Hubert T. Sparrow, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 13, 1970, Ser. No. 54,261
Int. Cl. H01f 7/00
U.S. Cl. 335—215 **9 Claims**

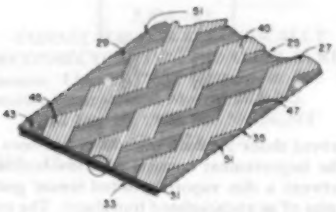


A magnetomechanical transducer utilizing a single layered magnetostrictive member. A biasing means causes a strain in the magnetostrictive material which gives rise to compressive and tensile stresses in the member. The coefficient of magnetostriction increases or decreases in portions of the member depending on the nature of the stress in the portion. When the member is subjected to a magnetic field the member will deflect as a result of the changed coefficient of magnetostriction.

3,638,154
BRAIDED SUPERCONDUCTOR

William B. Sampson, Bellport, and Richard B. Britton, Setauket, both of N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 26, 1970, Ser. No. 22,944
Int. Cl. H01f 7/22
U.S. Cl. 335—216 **21 Claims**



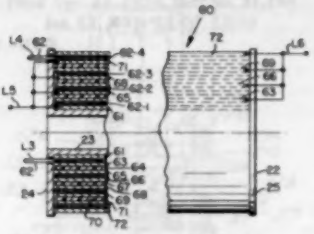
Magnet having braided superconductor windings for pulsed operation.

3,638,155
ELECTRICAL COIL HAVING INTEGRATED CAPACITANCE AND INDUCTANCE

Van P. Combs, Penfield, N.Y., assignor to Mega Power Corporation, Rochester, N.Y.

Continuation-in-part of application Ser. No. 800,383, Feb. 19, 1969, now Patent No. 3,568,040, dated Mar. 2, 1971. This application Nov. 6, 1970, Ser. No. 87,447
Int. Cl. H01f 15/14
U.S. Cl. 336—69 **6 Claims**

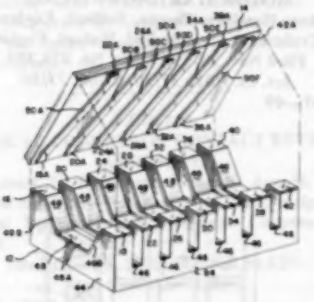
This coil comprises an annular core surrounded by a plurality of layers of electrically conductive wire windings separated from each other by at least one layer of metal foil, and at least one layer of elastic dielectric material. By selective connection of the wire windings and the intervening foil layers in electric circuits, the coil may be made to function selectively as a choke, filter, signal delay, or as a storage device or absorber for impulse energy. By adding axially extending metal strips to the coil between its layers of windings, the coil is suitable for use in an electric current generator of the magnetomotive variety.



3,638,156
MICROINDUCTOR DEVICE

Laurice J. West, 5 Jadewood Road, Levittown, Pa.

Filed Dec. 16, 1970, Ser. No. 98,829
Int. Cl. H01f 27/28
U.S. Cl. 336—200 **7 Claims**



A microinductor device comprising a ceramic body having opposing pairs of posts, each pair being separate from the other pairs, with a metallic path electrically uniting each of the separate pairs of posts, a printed circuit board having printed members electrically uniting neighboring posts of at least two post pairs, in order to provide a conductive path of the inductor type through a plurality of the pairs of posts, and a ferrite placed within the volume between pairs of posts.

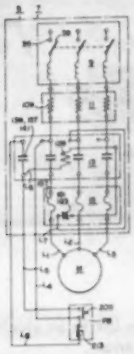
3,638,157
COMBINATION MOTOR STARTER

Zelco J. Kruzic, New Brighton, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 28, 1969, Ser. No. 828,466
Int. Cl. H01h 85/00
U.S. Cl. 337—6 **13 Claims**

An improved combination motor starter with low overload protection; adjustable low-level fault protection; heavy short circuit interrupting capacity; and a coordinated protection system that protects the motor, the cable and the components of the combination motor starter. More specifically, the low-level fault protection is given by a resettable circuit breaker, and a current-limiting fuse is used both to provide

heavy short circuit protection and to also operate fast enough and at low enough currents to protect against burnout or



damage of the heater or other current-responsive element of the device protecting the motor against overloads.

3,638,158

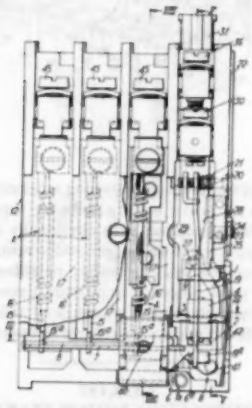
OVERLOAD TRIPPING DEVICES FOR ELECTRIC MOTOR STARTING SWITCHES

Arthur Robert Hamilton Thorne, Solihull, England, assignor to J. A. Crabtree & Co., Limited, Walsall, England

Filed Nov. 20, 1969, Ser. No. 878,389

Int. Cl. H01h *37/30, 61/00, 73/30*

U.S. Cl. 337—49 **5 Claims**



A thermal tripping device for protecting three-phase electric motors against balanced sustained overloads in each phase and against unbalanced overloads, which comprises a quick make and break overcenter spring actuated by a bell-crank connecting slidable trip bars operated by thermal overload elements in each phase. An adjustable reset plunger has a cam formation for enabling hand or automatic reset of the trip mechanism.

3,638,159

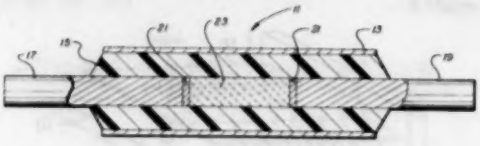
DECLINING RESISTANCE RESISTOR

David A. Kenney, Palos Verdes Estates, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Nov. 24, 1969, Ser. No. 879,205

Int. Cl. H01c *7/10*

U.S. Cl. 338—20 **13 Claims**



A solid-state timer device which is comprised of a housing containing a mixture of either a powdered photosensitive metal salt or oxide with an inert conductor. Electrical leads are in contact with the mixture so as to pass a current therethrough. The electrical resistance of the mixture linearly declines with elapsed time at a fixed DC voltage input.

3,638,160

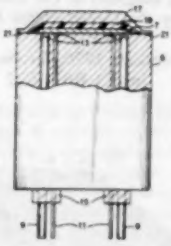
SHOCK PRESSURE TRANSDUCER

Roy L. Huddleston, Concord, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 4, 1969, Ser. No. 855,248

Int. Cl. H01c *7/00*

U.S. Cl. 338—36 **4 Claims**



An improved shock pressure transducer has been provided wherein the improvement consists of a low-resistance connection between a thin vapor-deposited sensor grid and the electrical pins of an encapsulated transducer. The connection in combination with other known parts produces a significant increase in the output of the transducer.

3,638,161

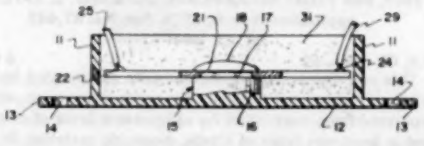
MODULARIZED RESISTANCE UNIT

Christ J. Dumas, Forest View, Ill., assignor to American Plasticraft Company, Chicago, Ill.

Filed Jan. 14, 1971, Ser. No. 106,502

Int. Cl. H01c *1/02*

U.S. Cl. 338—256 **10 Claims**



A modularized electrical resistance unit for use in connection with high-voltage systems which comprises a casing

body, a support boss mounted within the casing body, a resistance carrier mounted on the support boss and disposed within the casing body, and encapsulating material completely encapsulating the resistance carrier including the peripheral edges thereof. The casing body is provided with an enlarged chamber surrounding the anode terminal to accommodate a greater volume of encapsulating material, and a barrier wall and corresponding slot arrangement between the high-voltage and low-voltage terminals.

3,638,162

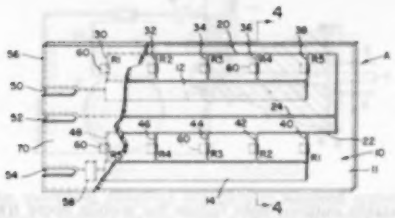
PROGRAMABLE ELECTRIC CIRCUIT CARD

John E. McWade, Broomall, Pa., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed May 4, 1970, Ser. No. 34,175

Int. Cl. H01c 1/16

U.S. Cl. 338—320 **7 Claims**



A flexible selective programable electrical circuit card including a flexible base onto which electrical film components and film connectors are applied. An indicia which allows the card to be punched in a manner to program the electrical components of the card.

3,638,163

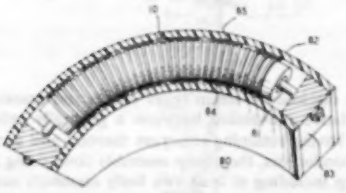
CONNECTOR FOR ELECTRICALLY INTERCONNECTING TWO PARALLEL SURFACES

Oskar Loosme, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 20, 1970, Ser. No. 56,341

Int. Cl. H05k 1/02

U.S. Cl. 339—17 M **7 Claims**



A universal, mass-producible connector which conducts electrical currents between conductive strips on uniformly spaced surfaces comprises a nonconductive body bearing on its periphery a plurality of conductive contacts. The device is conformable to curved, as well as flat, surfaces and facilitates assembly and disassembly of printed and integrated circuit structures without damage to mounted electrical components.

3,638,164

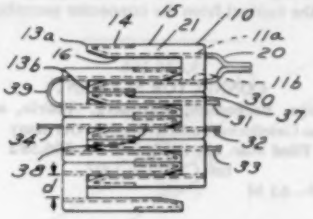
BISEXUAL ELECTRICAL CONNECTOR

Patrick M. Glance, Plymouth, Mich., and Thomas S. Ashley, Dallas, Tex., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 23, 1970, Ser. No. 31,186

Int. Cl. H01r 25/00, 13/50

U.S. Cl. 339—49 R **3 Claims**



A bisexual electrical connector made from a nonconductive material. The connector is designed to electrically and mechanically connect a plurality of flat flexible conductor strips. The connector has at least one U-shaped portion defined by a base and finger means projecting from the base, the finger means comprising two parallel projections spaced apart to form interlocking means into which projections from an identical connector are able to fit in a mating relationship. The conductor strips pass through the base of the connector and into means in the parallel projections adapted to receive the strips. Two or more of the conductors are mated together to mechanically and electrically connect the conductor strips, the projection or projections from one connector fitting into the space between the projections of another identical connector.

3,638,165

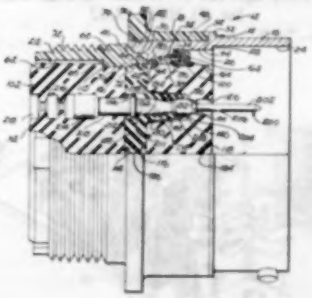
ELECTRICAL CONNECTOR CONTACT RETENTION ASSEMBLY

Jonn W. Anhalt, La Crescenta; Bruce K. Arnold, Pasadena, and Joseph Sugar, Los Angeles, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 29, 1970, Ser. No. 50,629

Int. Cl. H01r 13/40

U.S. Cl. 339—59 R **4 Claims**



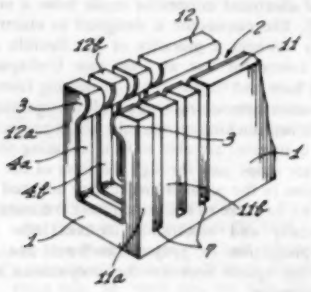
An electrical connector assembly contains removable contacts. An insulator member is mounted in the connector shell and has a plurality of cavities formed therein. A contact retention member comprises a disc portion, one face of which adjoins a face of the insulator. Yieldable clip members for securing the contact members in the connector assembly form an integral part of the retention member and extend from the disc portion face. The clip members are freely posi-

tioned in the insulator member cavities. The cavities limit a radial outward movement of the clip members when the contacts are inserted in the connector assembly. Each of the clip members may be split longitudinally and expanded radially upon insertion of the contact members. Further, the clip members may terminate in the cavities of the insulator member. The clip members abut the contact members at the clip termination and thus preventing the contacts from moving axially, once the contacts are fully positioned in the connector assembly. An insertion tool may be utilized for removal of the contact from the connector assembly.

3,638,166
CONNECTOR ELEMENT

Leo A. Steipe, Bachausen, Starnberg, Austria, assignor to Schaltbau Gesellschaft mbH, Munich, Germany

Filed Mar. 12, 1969, Ser. No. 806,582
Int. Cl. H05k *1/07*
U.S. Cl. 339—61 M 7 Claims

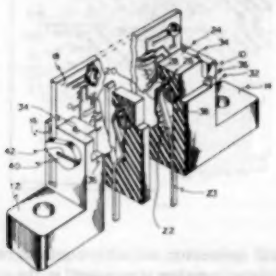


A connector element is disclosed which is cut from an elongated plastic bar made by extrusion and having a longitudinal groove lined with a conductive layer with notches being cut to form individual socket elements.

3,638,167
CONTROLLED INSERTION FORCE RECEPTACLE FOR FLAT CIRCUIT BEARING ELEMENTS

Carl Occhipinti, Melrose Park Post Office, and Dennis R. Cakora, Lyons, both of Ill., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Apr. 13, 1970, Ser. No. 27,870
Int. Cl. H01r *13/62*
U.S. Cl. 339—74 R 10 Claims

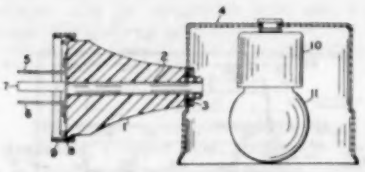


A controlled insertion force receptacle for flat circuit bearing elements such as printed circuit boards. A first block of an insulating material having a slot in it which is adapted to receive the element. At least one contact finger is mounted in the first block and is positioned so as to make physical and electrical contact with a contact point on the element when the element is in the slot. A second block of an insulating material is mounted on the first block in a manner so as to be free to move relative to the first block in a direction perpendicular to the walls of the slot. The second block engages the contact fingers and causes the fingers to move to controlled positions in or out of the slot as the second block is moved relative to the first block. A member such as a camshaft is provided for moving the second block relative to the first block.

3,638,168
PORTABLE OUTDOOR LIGHTING FIXTURE FOR MOBILE HOMES

Alfred Robbins, 80 East Gates Ave., Lindenhurst, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,035
Int. Cl. H01r *33/04*
U.S. Cl. 339—89 M 1 Claim

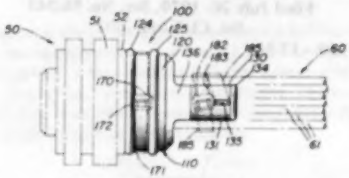


A portable outdoor light fixture for mobile home trailers comprises a unitary molded plastic member having electrical prongs at one end and a molded threaded portion at its other end adapted to receive a standard light fixture and having a shaftway connecting the ends for wiring.

3,638,169
STRAIN RELIEF CLAMP AND ASSEMBLY

Jack E. Caveney, Chicago, and Roy A. Moody, Flossmoor, both of Ill., assignors to Pandult Corp., Tinley Park, Ill.

Filed Jan. 12, 1970, Ser. No. 2,079
Int. Cl. H01r *13/58*
U.S. Cl. 339—107 24 Claims



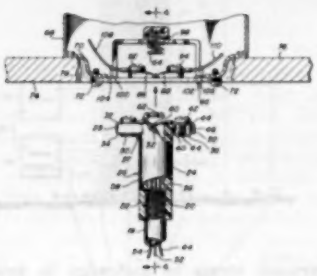
There is disclosed a strain relief clamp and assembly for limiting relative movement between a generally cylindrical connector having retaining structure thereon and a cable of electrical conductors, the clamp assembly comprising a strain relief clamp including at least two body members each having a part-cylindrical connector body portion and a part-cylindrical cable body portion and an interconnecting portion joining the connector body portion and the cable body portion, a first binder tie clamping the connector body portions about the connector to provide engagement between locking structure on the connector body portion and the retaining structure, a second binder tie clamping the cable body portions about the cable at a predetermined position therealong, hinges interconnecting the two body members, and binder tie positioning structure provided on the connector body portions and the cable body portions.

3,638,170

ELECTRICAL COUPLING MECHANISM

Clyde H. Clement, 8439 North 13th Pl., Phoenix, Ariz., and Leland B. Larson, 4069 East Campbell, Phoenix, Ariz., assignors to Clyde H. Clement and Leland B. Larson, Phoenix, Ariz., part interest to each

Filed Sept. 23, 1970, Ser. No. 74,730
Int. Cl. H01r 13/32
U.S. Cl. 339—135 10 Claims



An electrical coupling mechanism adapted removably to suspend a lighting fixture from a ceiling structure of a building room; wherein a mounting plate is supported by a utility box; and a lighting fixture hanger is manually rotatably insertable through an opening in said mounting plate thereby concurrently making electrical and mechanical supporting connection for said lighting fixture whereby said lighting fixture and said hanger may be readily removed mechanically and electrically disconnected relative to structure and electrical contacts on said mounting plate.

3,638,171

TERMINAL STRUCTURE FOR WIRING DEVICES

Cornelis Hulbrechtse, Weston, Ontario, Canada, assignor to Canadian General Electric Company Limited, Toronto, Ontario, Canada

Filed Apr. 25, 1969, Ser. No. 819,209
Int. Cl. H01r 11/22
U.S. Cl. 339—164 R 7 Claims

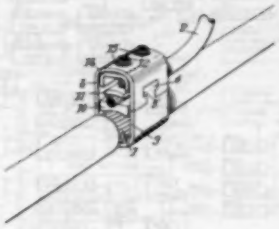
This invention relates to an improved push-in type terminal construction for wiring devices using a resilient beam constrained at one end and freely supported at the other instead of the conventional cantilever. A greater clamping force and simplified construction is provided and the terminal is mountable in a wiring device so as to be visible.

3,638,172

CABLE CLAMPING DEVICE

Georges Clement Adam, 5, rue des Ajoux, 92 Courbevoie, France

Filed Apr. 23, 1968, Ser. No. 723,409
Claims priority, application France, Apr. 24, 1967, 103,836
Int. Cl. H01r 7/14
U.S. Cl. 339—249 7 Claims



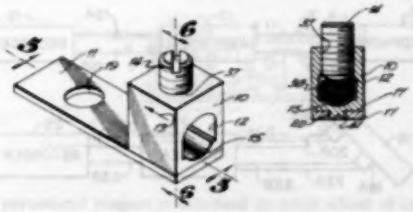
The device assures an electrical and mechanical connection between two bare sections of electric cables by clamping these sections together. The device comprises two distinct elements that can be assembled together to form a ring surrounding the two bare cable sections, and means for clamping together the sections disposed at the interior of this ring. The two elements comprise relatively thick plates curved in the form of U's of the same width, and the ends of the wings of these U's are cut out with complementary tenons and mortises such that these wings can be fitted together two by two to close the ring, only in a direction perpendicular to their middle planes.

3,638,173

ELECTRICAL CONNECTING LUG

William H. Middendorf, Fort Mitchell; Ralph S. Myers, Covington; Edward J. Fritz, Florence, and Jack N. Koch, Melbourne, all of Ky., assignors to The Wadsworth Electric Mfg. Co., Covington, Ky.

Filed Nov. 12, 1969, Ser. No. 875,926
Int. Cl. H01r 11/10
U.S. Cl. 339—272 U 4 Claims



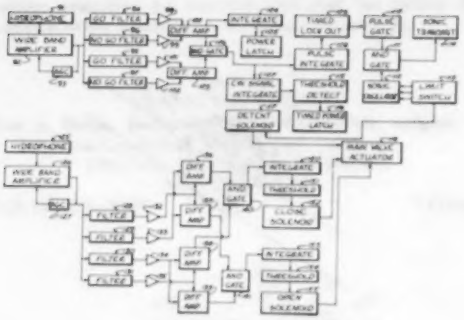
A connector lug for electrical wires, the lug having an extruded body, a hole through the body in the extrusion direction, a rib extending in the extruded direction, and an elongated tang mounted on said rib and projecting from said body in the extrusion direction.

3,638,174

REMOTE CONTROL METHODS AND SYSTEMS

Wallace H. Haase, Northridge; Albie Alton Lyman, Jr., Granada Hills, and Daniel W. Painter, II, Sepulveda, all of Calif., assignors to The Bendix Corporation

Filed May 27, 1969, Ser. No. 828,273
Int. Cl. H04b 11/00
U.S. Cl. 340—5 R 8 Claims



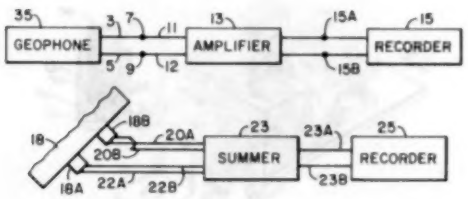
This invention relates to improvements in remote control systems and operating methods. The embodiment selected for illustration is arranged for actuation of a valve in a submerged pipeline. The system includes a controlling station comprising a transmitter and a receiver of sonic signals and it includes a controlled station submerged with the valve and comprised of a receiver and a transmitter. The controlling station is capable of sending arming, interrogation and control signals to the controlled station. The operating and interrogating codes employed in the system include at least two different frequency components and require that certain other frequency components be absent. The receiver of the control station is responsive to such codes to arm the receiver to receive an interrogation signal and an actuating command signal. It is effective upon receiving the interrogation signal to cause a response to be transmitted indicating the condition of the valve to be controlled and placing the system in condition to receive valve control instruction.

3,638,175

NOISE REDUCTION ON SEISMIC RECORDS

Webster R. Stone, Sydney, New South Wales, Australia, assignor to Esso Production Research Company

Filed Mar. 10, 1970, Ser. No. 18,156
Int. Cl. G01v 1/36
U.S. Cl. 340—15.5 3 Claims



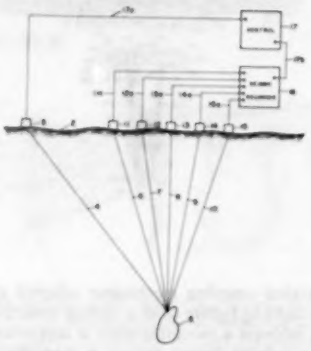
Certain types of coherent noise on seismic records made from a plurality of seismic disturbances in the same local area, is eliminated by reversing the polarity of the signals to be recorded on alternate recordings, or on half of the total number of recordings. The recorded signals are reproduced and summed with the polarity of half of the reproduced signals again reversed so that reflection events are in time-phase. Coherent noise originating within the recorder will be of opposite time-phase and will not appear on the summed record.

3,638,176

SEISMIC DIFFRACTION SCAN

James E. White, Midland, Tex., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 5, 1970, Ser. No. 514
Int. Cl. G01v 1/00
U.S. Cl. 340—15.5 6 Claims



Diffractive elements which are reported by acoustical waves in seismic exploration can be defined by a process wherein seismic traces from a plurality of seismic receivers are shifted by T (T = the travel time from a particular acoustical wave source to a diffractive element and thence to a particular seismic receiver), whereupon the seismic traces are added and the summation of the added seismic traces is indicative of the diffractive power of each diffractive element. The invention further comprises the shifting of seismic traces produced by a plurality of receivers by T and thence adding cross-correlations (the product of multiplying one member of a pair of seismic traces by the other member of the pair) among pairs of seismic traces wherein the summation is indicative of the diffractive power of each diffractive element.

3,638,177

METHOD AND APPARATUS FOR SEISMIC SIGNAL VELOCITY DETERMINATION

Paul V. Lindblade, Ponca City, Okla., and Paul G. Mathieu, Pittsburgh, Pa., assignors to Continental Oil Company, Ponca City, Okla.

Filed July 25, 1969, Ser. No. 844,898
Int. Cl. G01v 1/00
U.S. Cl. 340—15.5 GC 7 Claims

A method for determining actual velocities of seismic events occurring on plural seismic traces by deriving a trace coherence factor which varies directly with signal velocity. The method consists of processing move-out-corrected, plural seismic traces at a plurality of different time delay per trace relationships to establish a coherence factor at each time delay per trace. The coherence factor is arrived at for each probable velocity by summing all trace values and then finding a respective difference value as between each of the trace values and the sum value, which difference values are further processed by summation of their absolute values for derivation of a reciprocal trace value. The reciprocal trace value is then utilized as a gain control factor for controlling

time variation of the amplitude of summed seismic traces, and the output trace value so controlled constitutes an accu-

rate indicator of coherence of events occurring at the selected velocity.

3,638,178

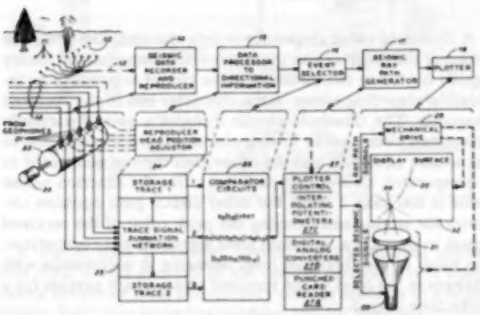
METHOD FOR PROCESSING THREE-DIMENSIONAL SEISMIC DATA TO SELECT AND PLOT SAID DATA ON A TWO-DIMENSIONAL DISPLAY SURFACE

Lee P. Stephenson, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of application Ser. No. 706,470, Feb. 19, 1968, now abandoned , Continuation of application Ser. No. 452,582, Apr. 28, 1965, Continuation-in-part of application Ser. No. 99,213, Mar. 29, 1961, now abandoned. This application Dec. 1, 1969, Ser. No. 878,968

Int. Cl. G01v *1/24, 1/34*

U.S. Cl. 340—15.5 **18 Claims**



A method and apparatus for processing seismic data to display representations of reflectors within a three-dimensional volume. The data is collected with a surface geophone array in response to a single seismic source. Separate portions of the data are processed to identify reflectors with respect to certain of the geophones. These separately processed data are then compared to isolate common identifications of the same reflector. Coordinate information applicable to the isolated identification are then resolved to position the reflector within the three-dimensional volume. A projection of that position is then produced on a display surface to provide a two-dimensional representation of the reflectors within the three-dimensional volume.

3,638,179

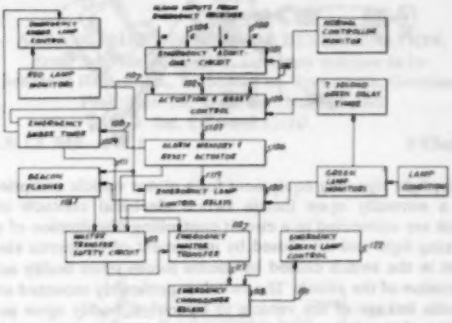
EMERGENCY VEHICLE CONTROL OF TRAFFIC SIGNALS

Edward T. Coll, Philadelphia, Pa.; Harold J. Braschwitz, North Royalton; Charles Grace, Bracksville, both of Ohio; Michael J. Manchester, Philadelphia, Pa., and Stephen A. Hunter, III, Charlotte, N.C., assignors to Martha H. Egly, Philadelphia, Pa.

Filed Apr. 16, 1968, Ser. No. 721,668

Int. Cl. G08g *1/00*

U.S. Cl. 340—32 **8 Claims**



The present system provides a traffic light control system which enables an emergency vehicle such as a fire engine, ambulance or the like to control all traffic lights at each intersection through which it will pass in the course of its intended travel. The traffic lights can be rendered one green and three red at each said intersection along the route with the green light facing the oncoming emergency vehicle. In the alternative the system provides a means for rendering the traffic lights all red at each intersection thereby stopping the traffic in all directions and enabling the emergency vehicle to weave in and out of the stopped traffic.

3,638,180

ALARM FOR SIGNALLING TIRE MALFUNCTION

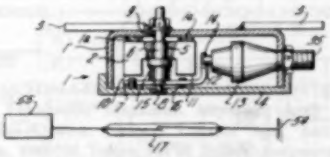
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale Des Etablissements Michelin, raison sociale Michelin & Cie., Clermont-Ferrand, France

Filed July 23, 1969, Ser. No. 844,096

Claims priority, application France, July 29, 1968, 161063; May 23, 1969, 6917132

Int. Cl. B60c *23/00*

U.S. Cl. 340—58 **4 Claims**



A permanent magnet is mounted on each wheel of an automotive vehicle. In case of low pressure in one of the vehicle tires, the external magnetic field of the magnet mounted on the wheel for that tire is modified by an automatic movement of either the magnet or a shunt associated therewith. A magnetic field responsive switch is mounted on the vehicle frame next to each wheel-tire assembly. The switch next to the malfunctioning tire responds to the change in the magnetic field to activate a signal alerting the driver of the vehicle.

3,638,181
VEHICLE DECELERATION SIGNALING APPARATUS

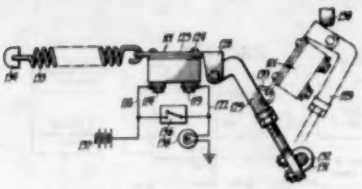
Ensor Alexander Bryant, No. 4 Wimmera Avenue Manifold Heights, Geelong, Victoria, Australia

Continuation-in-part of application Ser. No. 706,909, Feb. 20, 1968, now abandoned. This application Mar. 28, 1968, Ser. No. 721,552

Claims priority, application Australia, Feb. 23, 1967, 18159/67

Int. Cl. B60q *1/50;* **H01h** *35/14*

U.S. Cl. 340—71 **6 Claims**



Stoplight signaling equipment for a motor vehicle comprising a normally open inertia switch electrical contacts of which are connected in a circuit controlling illumination of a warning light and are closed by movement of an inertia element in the switch caused by inertia forces upon bodily acceleration of the switch. The switch is preferably mounted on throttle linkage of the vehicle to be moved bodily upon actuation of that linkage so that on sudden release of the throttle the switch is accelerated bodily to cause closure of contacts whereby light is illuminated even before vehicle brake is applied.

ERRATUM

For Class 340—146 see:
Patent No. 3,638,238

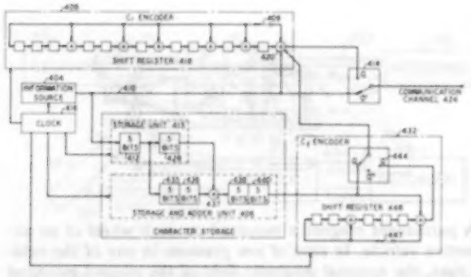
3,638,182
RANDOM AND BURST ERROR-CORRECTING ARRANGEMENT WITH GUARD SPACE ERROR CORRECTION

Herbert O. Burton, Little Silver, N.J.; Sudhakar M. Reddy, Iowa City, Iowa; Daniel D. Sullivan, Howell Township, Monmouth County; Shih Y. Tong, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 2, 1970, Ser. No. 325

Int. Cl. G06f *11/12*

U.S. Cl. 340—146.1 **13 Claims**



Information sequences are encoded in a first block code capable of correcting a certain number of random errors. Portions of previously encoded information sequences or sequences derived therefrom are, in turn, encoded into a second block code which is a shortened version of a super code of the first block code. These encoded portions are added to the code words of the first block code and the resultant sequences are transmitted to a receiving station. At the receiving station, each received sequence is decoded to determine if the number of random errors is less than a certain threshold value related to the error-correcting ability of the first block code. If so, the sequence is corrected using a random error-correcting technique. If not, the information portion of the sequence is replaced with information derived from subsequently received sequences (i.e., sequences which are in the guard space). Random errors which may have occurred in these subsequently received sequences are corrected prior to such replacement utilizing the super code.

3,638,183
THRESHOLD VALUE CIRCUIT

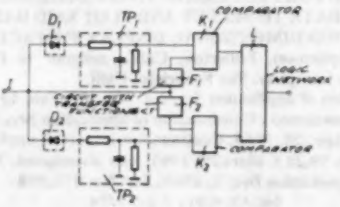
Max Progler; Klaus Wessenberg; Winfried Wagner, all of Ulm(Danube), and Horst Ohnsorge, Erstetten, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Mar. 9, 1970, Ser. No. 17,635

Claims priority, application Germany, Mar. 7, 1969, P 19 11 678.0; Sept. 26, 1969, P 19 48 738.8

Int. Cl. G08c *25/00*

U.S. Cl. 340—146.1 **21 Claims**



A threshold value circuit for a data transmission system in which at the receiver site the transmitted demodulated binary signals are fed to the threshold value circuit to produce an indication regarding errors in the character bits of the received character. The threshold circuit includes a pair of parallelly connected circuit paths having one end thereof connected to the source of signals and the other ends thereof connected to a comparator. One circuit path has a transfer function whose value is less than 1 while the other circuit path contains circuitry for storing and delaying the peak value of the received signal to provide a threshold level signal for the comparator; the value of the threshold level changing in accordance with changes in the level of the received signal which persists for a given time period.

3,638,184
PROCESSOR FOR $_m$-OUT-OF-$_n$ CODE WORDS

Hugh Jacob Beuscher, Winfield, Ill.; Donald Robert Nelson, Madison, Wis.; William Howard Sisson, Villa Park, and Wing Noon Toy, Glen Ellyn, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

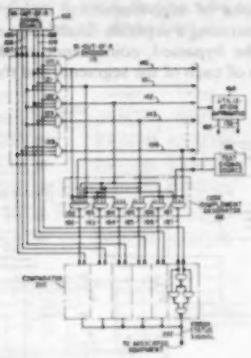
Filed June 8, 1970, Ser. No. 44,270

Int. Cl. H03k *13/32*

U.S. Cl. 340—146.1 **5 Claims**

A conventional decoder of the type that converts an *m*-out-of-*n* representation to activation of only a single one of plural output lines is modified to have powerful self-checking capabilities. The modified decoder is adapted to be included

in a control system in which the words stored in a microprogram memory are coded in an *m*-out-of-*n* format. Such a



system automatically detects the occurrence of any no-output or multiple-output readout from the memory.

3,638,185

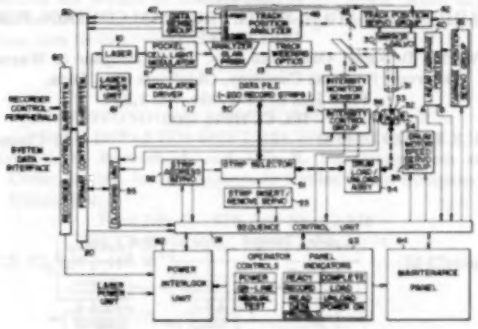
HIGH-DENSITY PERMANENT DATA STORAGE AND RETRIEVAL SYSTEM

Harold R. Deil, Palo Alto; Masao Hashiguchi, Mt. View, and Edward D. Lara, Cupertino, all of Calif., assignors to Precision Instrument Company, Palo Alto, Calif.

Filed Mar. 17, 1969, Ser. No. 807,551

Int. Cl. G11c *29/00*

U.S. Cl. 340—146.1 **13 Claims**



A digital data processing system for transferring digital data from a data channel of the central processor of a computing system or from a temporary storage medium to a high-density laser data recording medium and for nondestructively reproducing the data stored in the high-density medium in a form suitable for transfer to a computer data channel or temporary storage for subsequent use. Input data is transferred into a buffer and control subsystem. This subsystem generates synchronous clock signals and data verification signals which are interleaved with the input data and the composite signal thus produced is recorded on the high-density storage medium. Each recorded bit is checked to insure accuracy of recording at the instant of recording that bit, and remedial action is automatically initiated in the event of error. This remedial action consists of recording a completely unambiguous error indication signal, and re-recording the affected data in such a manner that the final record provides sufficient information to permit correction of all recording errors. During readout the retrieved data is transferred from the high-density storage medium into the buffer and control subsystem for verification of the data. If the data is correct, the synchronous clock and data verification signals are stripped from the output data, the data is reorganized into its original format, and transferred to a computer data channel or other storage medium for subsequent use. If during readout an error is detected, remedial action is automatically initiated before the data is transferred. The buffer and control subsystem includes self-checking diagnostic circuits for detecting and localizing malfunctions in all portions of the high-density data storage and data conversion system.

3,638,186

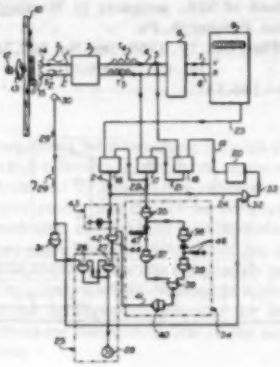
ARRANGEMENT FOR ERROR DETERMINATION,

Ernst Schwefel, Chieming, Germany assignor to Dr. Johannes Heidenhain, Traunreut nr. Traunstein, Germany

Filed Sept. 26, 1969, Ser. No. 861,265

Int. Cl. G06f *11/10*

U.S. Cl. 340—146.1 **9 Claims**



A method and device for error prevention in incremental measuring systems which comprise a measuring scale and a sensing device producing, during relative movement, sensing signals, and an electronic circuit, and a counter circuit of a measuring system. A comparison is performed of the residue of the counter result after subtraction of a whole multiple of a full number *n* with signals and signal combinations, respectively, derived from the sensing signals which bypass the counter circuit.

3,638,187

AUTOMATIC CURVE TRACING SYSTEM

Tadashi Takahashi; Masatoshi Miyazaki, both of Sendai; Yasuhiko Ogawa, Natori; Tadashi Sato, and Kazuhiko Kakuta, both of Tokyo, all of Japan, assignors to Iwatsu Electric Company, Ltd., Tokyo, Japan

Filed May 28, 1970, Ser. No. 41,291

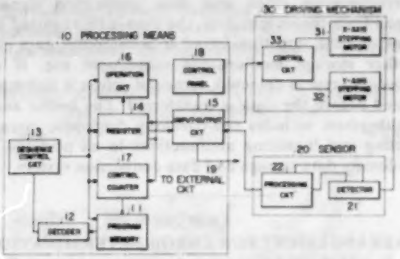
Claims priority, application Japan, May 31, 1969, 44/42078

Int. Cl. G06k *11/02, 9/16*

U.S. Cl. 340—146.3 **6 Claims**

In an automatic curve tracing system wherein an area including a curve to be traced is subjected to a round scanning operation of a detector to produce a positional information and the detector is moved in a predetermined direction over a predetermined direction in response to the positional information, there is provided apparatus for processing an acute

angle included in the curve including means to store a previous tracing direction and means to determine a particular direction having a minimum difference with respect to the previous tracing direction and within prescribed limits.

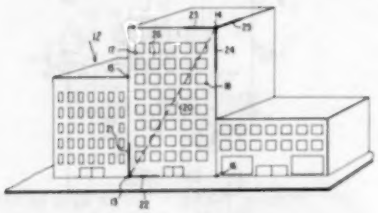


3,638,188

CLASSIFICATION METHOD AND APPARATUS FOR PATTERN RECOGNITION SYSTEMS

Peter H. Pincoffs, Severna Park, and Glenn E. Tisdale, Towson, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1969, Ser. No. 867,247
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3AC **13 Claims**



Features are extracted from a two-dimensional image for subsequent classification of patterns within the image according to correspondence between the extracted features and reference features in a set extracted previously from known patterns. In extracting the features, measurements are first taken of observed characteristics of the image about two or more predefined points in the image, these measurements being chosen to be invariant regardless of orientation, scale, and position of the pattern in the image. The measurements, along with data regarding relative positions of the selected points, constitute the features from which eventual pattern recognition may be achieved. In the classification procedure, the features extracted from the image are compared with reference features for a set of known pattern classes, in order to classify any unknown pattern that may be present within the image and that is associated with at least some of the extracted features.

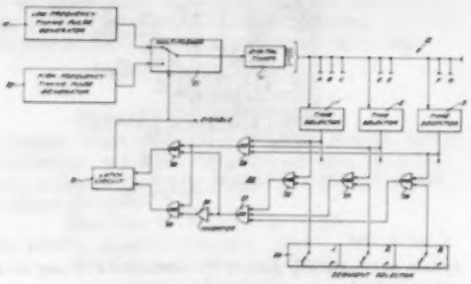
3,638,189

SIMPLIFIED MEANS OF SKIPPING SELECTABLE SEGMENTS OF A TIMED PROGRAM

Larry D. Gamache, Yorba Linda; Christopher F. Miller, Diamond Bar, and Kenneth W. Barr, La Habra, all of Calif., assignors to Beckman Instruments, Inc.

Filed Feb. 2, 1970, Ser. No. 7,784
Int. Cl. H04q *9/00*
U.S. Cl. 340—147 **6 Claims**

In a programmer for controlling the operation of a plurality of segments in a multiple segment selector system that normally sequences all segments in series, wherein a source of low-frequency timing pulses is applied to a digital timer which sequentially activates the segments, a simplified means for selectively bypassing any number of said segments comprising a source of high-frequency timing pulses, selector means for generating a separate disable signal for each of the segments to be bypassed, coincidence means responsive to the activation of each of the segments and the selector means for generating a triggering signal upon the simultaneous occurrence of the activation of a segment and a disable signal for such segment, and means responsive to the occurrence of a triggering signal for switching the input of the digital timer from the low-frequency timing pulse source to the high-frequency timing pulse source so that the segment to be bypassed is executed at a very high speed relative to normal operation whereby the timer is rapidly sequenced to the next segment.

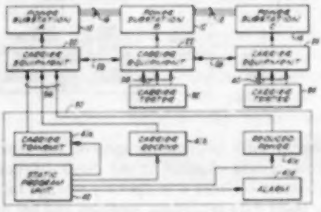


3,638,190

ADJUSTABLE SOLID-STATE PROGRAM CONTROL FOR TEST SYSTEMS

Marion D. Knox, Oklahoma City, Okla., assignor to Wayne Electronic Products Company, Oklahoma City, Okla.

Filed Jan. 8, 1970, Ser. No. 1,524
Int. Cl. H04q *9/00*
U.S. Cl. 340—147 R **11 Claims**

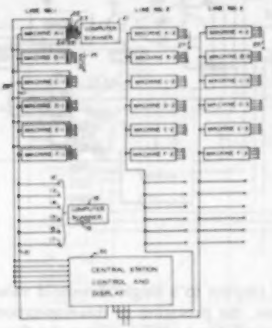


Apparatus for performing automatic control of carrier systems which apparatus consists of solid-state circuitry utilizing no moving parts and which performs program timed operations as between a master transmitting and receiving carrier system and one or more remotely disposed transmitting and receiving carrier units. The apparatus consists of a time base generator which can provide a selected sequence of outputs for application to control an adjustable program matrix through a series of carrier control functions. Outputs from the programmable matrix are then applied to selected components of the carrier system to effect the desired control functions at the proper times.

3,638,191
PRODUCTION MONITORING SYSTEM

Charles G. Mann, Farmington, Mich., assignor to Weltronic Company, Southfield, Mich.

Filed Jan. 8, 1968, Ser. No. 696,462
Int. Cl. H04q *5/00*
U.S. Cl. 340—163 **19 Claims**

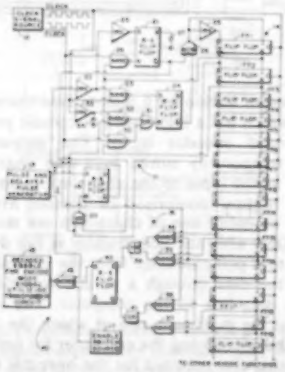


A system providing an interface between work stations in a manufacturing plant and a central station which may include signals to supervisory personnel, and means to apply signals to a supervisory computer. The computer is arranged to regularly monitor a restricted scope of production criteria and in response to any change indicating a significant alteration in plant operation, to review a broadened scope of production criteria and information. Work stations are broken down into groups and groups into lines such that computer time is efficiently utilized by reviewing in detail only the work stations of a group in which a significant change has occurred. Indicators at the central station are oriented to reflect conditions on a line of work stations and include the feature of treating the line as "down" when any station in the line is "down," even though the remaining stations may be in a "run" status.

3,638,192
ASYNCHRONOUS PULSE INFORMATION CLOCK PHASE IMPARTED SHIFT REGISTER DECODER

Kenneth R. Rutherford, and Lyle R. Strathman, both of Cedar Rapids, Iowa, assignors to Collins Radio Company, Dallas, Tex.

Filed July 6, 1970, Ser. No. 52,226
Int. Cl. H04q *9/00*; **H04l** *27/24*, *27/14*
U.S. Cl. 340—168 R **20 Claims**

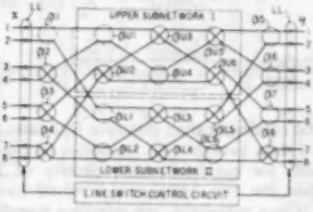


An asynchronous data to clock phase scripted shift register encoder and time/phase decoder circuit with clock phase information in the shift register in the form of two clock period wide pulses or one clock period wide pulses depending on the asynchronous data being either in phase or out of phase respectively with the clock. The system enables a reduction in shift register elements by a factor of 2 to 1, maximizes the decoder gate aperture, and the time decoder is capable of determining the correct delay to within one-half a clock period while a conventional shift register decoder does so only to within one clock period.

3,638,193
β-ELEMENT SWITCHING NETWORK CONTROL

David Clement Opferman, Middletown, N.J., and Nelson Tsin Tsao-Wu, Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 2, 1970, Ser. No. 7,871
Int. Cl. H04m *7/00*
U.S. Cl. 340—172.5 **13 Claims**

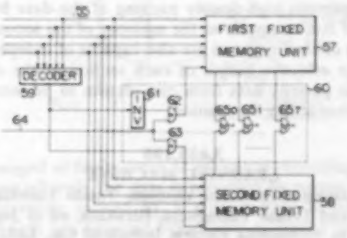


Control arrangement for a switching network comprised of reversing switch β-elements in which the states of the β-elements are determined by repetitively subdividing the list of input and output points that are to be connected together into sublists such that each sublist is independent in that it does not contain more than one terminal of any β-element in the network. The iterations are advantageously performed by modifying the terminal numbers encoded in a binary one-less code. The control arrangement provides for automatically achieving nonblocking interconnection of the network input and output points.

3,638,194
FIXED MEMORY APPARATUS

Shigenori Matsushita, and Tatsuo Ishikawa, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Company Limited, Kawasaki-shi, Japan

Filed Mar. 25, 1970, Ser. No. 22,433
Claims priority, application Japan, Dec. 16, 1969, 44/100602
Int. Cl. G11c *5/02*
U.S. Cl. 340—172.5 **15 Claims**



A fixed memory apparatus comprising a first memory unit having a fixed configuration in which it is substantially impossible to alter the memory content, a second fixed memory unit in which the memory content is relatively easily altered and a logic control means for logically controlling the memory contents read out of both said fixed memory units.

3,638,195

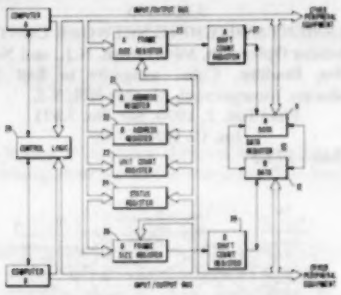
DIGITAL COMMUNICATION INTERFACE

Ronald F. Brender, and John L. Foy, Jr., both of Ann Arbor, Mich., assignors to The Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of application Ser. No. 835,072, June 20, 1969, now abandoned. This application Apr. 13, 1970, Ser. No. 27,940

Int. Cl. G06f 3/00

U.S. Cl. 340—172.5 **4 Claims**



The digital communication interface facilitates the transfer of blocks of data between the memories of two computers and provides for maximum data density of information storage when the two computers involved have different word sizes. Once initialized, the interface transfers data via cycle-steal with respect to the two computers' memories. Either computer may detect the status of the interface at any time during a data transfer and can halt or modify the operation as desired. When a transfer operation has been completed, the interface can signal either or both computers. The interface includes a data register which is divided into two sections. The number of bits in each section corresponds to the number of bits in the memory word of each of the two computers. Thus, if the two computers have different word sizes, the two sections of the data register will have different lengths. The data register is a circular bidirectional shift register which provides a parallel-to-serial-to-parallel data path. The operation of the interface during data-transfers is completely controlled by registers internal to itself which can be loaded by either computer. The condition of the data-handling circuits is indicated at all times by these registers which can also be read by either computer. This allows the interface to be commanded fully by either computer or by both. The control registers are capable of controlling the unit size of contiguous groups of data words transferred between the memories of the two computers such that the unit size may be either the least common multiple of the word size of each of the two computers or the smaller of the two word sizes. In the latter case a word-for-word relationship is maintained, whereas this is not true in the former case. The former case, however, permits high-density packing of the data from the memory of one computer to the memory of the second computer. The control registers are also capable of independently varying the effective length of each section of the data register. This permits data from one section to be introduced into the other at any bit position.

3,638,196

LEARNING MACHINE

Akira Nishiyama; Hirokazu Yoshino; Tomio Yoshida, all of Osaka, and Tetsuo Yamaguchi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

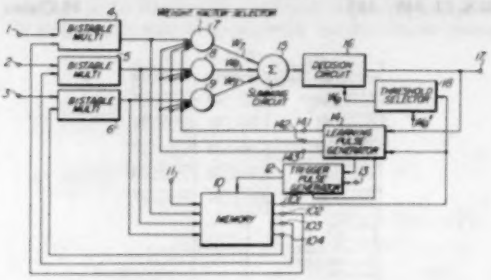
Filed July 13, 1970, Ser. No. 54,231

Claims priority, application Japan, July 14, 1969, 44/56642; 44/56643

Int. Cl. G06f 15/18

U.S. Cl. 340—172.5 **8 Claims**

A learning machine in which threshold values corresponding to the desired output conditions and having a dead zone therebetween are used during the learning process for the discrimination of the output from a memory storing a plurality of standard pattern information, and this discriminating faculty is utilized for the discrimination of input pattern in-



formation with respect to a single threshold value having no dead zone. Thus, the precision of discrimination can be remarkably improved due to the fact that the threshold values having a dead zone are used during the learning process, and the learning can be digitally and automatically carried out.

3,638,197

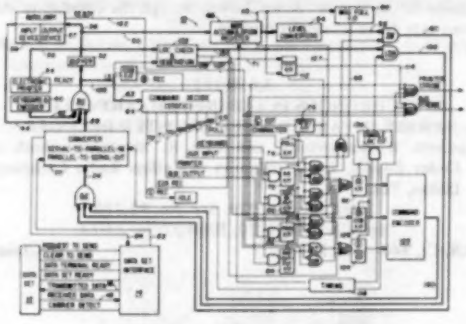
ELECTRONIC PRINTING INPUT-OUTPUT STATION

James Brennan, Jr.; Hermon L. Pope, Jr., and Donald F. Boren, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1968, Ser. No. 788,226

Int. Cl. G06f 3/12

U.S. Cl. 340—172.5 **27 Claims**

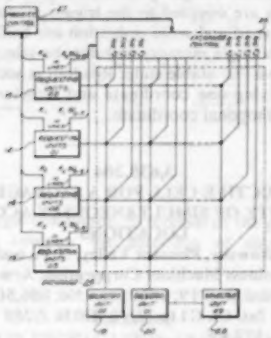


An input-output station for a remote time-shared computer is described which has a high-speed electronic printer output and a keyboard encoder input. The output from the keyboard is temporarily stored in a one character buffer which serves as the input to the electronic printer and to an accumulator register comprised of parallel MOS shift registers where an entire line of characters are stored as they are printed. Only after the accumulator is full does the station respond to a poll character from the central processing unit to send the data through a parallel-to-serial converter and over the data link to the computer. The input to the computer is at the maximum rate at which the data can be transmitted, thus occupying the computer for only a fraction of the time otherwise required for the operator to enter the data direct from the keyboard. Data sent from the computer is routed through the converter to the buffer and is printed out by the high speed electronic printer at the maximum rate. This system provides for most efficient use of the computer by the input-output stations.

3,638,198
PRIORITY RESOLUTION NETWORK FOR INPUT/OUTPUT EXCHANGE

Edward Balogh, Jr., Diamond Bar, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 9, 1969, Ser. No. 840,208
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **8 Claims**

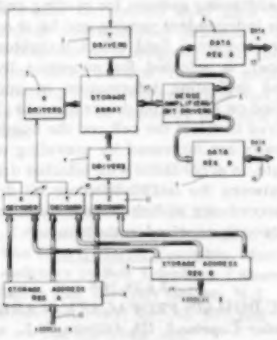


There is described a circuit for resolving priority between a number of requesting units and a number of accessible units in which priority is normally assigned on a first-come, first-served basis, but in which priority between substantially simultaneous requests for the same accessible unit is assigned in a predetermined sequence. Requests made to the other accessible units during priority resolution may be serviced out of sequence. The circuit is modular for both a number of requesting units and a number of accessible units.

3,638,199
DATA-PROCESSING SYSTEM WITH A STORAGE HAVING A PLURALITY OF SIMULTANEOUSLY ACCESSIBLE LOCATIONS

Eugene Kolankowsky, Pleasant Valley, and Robert F. McMahon, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1969, Ser. No. 886,508
Int. Cl. G06f *1/00*
U.S. Cl. 340—172.5 **6 Claims**

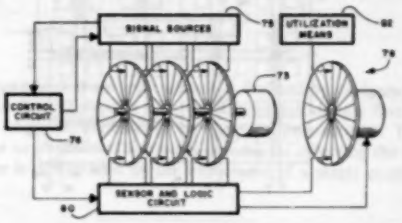


In a data-processing system, a central processing unit and a group of input/output units simultaneously read information from, and write information into, several locations of a single storage unit. The storage is provided with two storage address registers and two data registers. Each storage address register specifies a location in storage with which information in the associated data register is communicated. The storage is an array of storage elements each of which is selected by driving two out of three wires associated with that storage element. Characterizing the three wires as X, Y and Z, each location is accessed by driving the Z-wire for that location and one of the X- or Y-wires. A magnetic core, capable of assuming one of two states in accordance with half select information on two of three wires threaded through it, is disclosed as an example of a storage element. Sense amplifiers, connected to the X- and Y-wires, receive stored information from the undriven wire.

3,638,200
ELECTROSTATIC RECORDING SYSTEM

James P. La Point, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 4, 1970, Ser. No. 16,508
Int. Cl. G11c *11/24*; **G11b** *25/04*; **G01d** *15/06*
U.S. Cl. 340—173 CA **5 Claims**

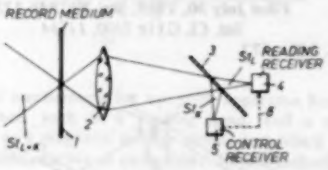


Electrostatic recording wherein a plurality of segments on an insulative member are capacitively coupled to a conductive element coextensive with the segments, with coupling of electrical signals to segments to charge the segments and sensing of charges on these segments, together with relative movement of the segments and the coupling and sensing means.

3,638,201
OPTICAL DATA STORAGE SYSTEM

Manfred Borner, Ulm (Danube), Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Germany

Filed June 29, 1970, Ser. No. 50,607
Claims priority, application Germany, June 28, 1968, P 19 32 840.6
Int. Cl. G11c *13/04*
U.S. Cl. 340—173 LM **4 Claims**



Damaged or faulty areas of an optical recording medium of the type wherein the data is recorded by means of selective discolorations caused by a writing light beam of a first wavelength are detected by utilizing a control beam of light in addition to the usual readout light beam during the optical nondestructive readout of the data. The control beam has a wavelength which is different from that of the readout beam and will not be absorbed by the discolored portions of the recording medium. The control beam and the readout beam are separately detected and those portions of the recording

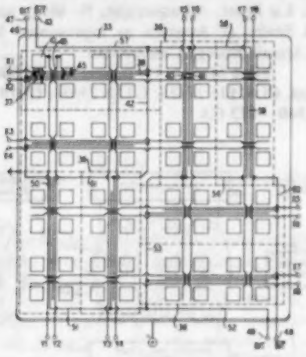
medium which produce modulation of both the reading and control beams as the result of absorption of both beams are identified as being damaged.

3,638,202

ACCESS CIRCUIT ARRANGEMENT FOR EQUALIZED LOADING IN INTEGRATED CIRCUIT ARRAYS

Paul Robert Schroeder, Allentown, Pa., assignor to Bell Telephone Laboratories Incorporated, Berkeley Heights, N.J.

Filed Mar. 19, 1970, Ser. No. 21,090
Int. Cl. G11c *5/06*
U.S. Cl. 340—173 FF **13 Claims**



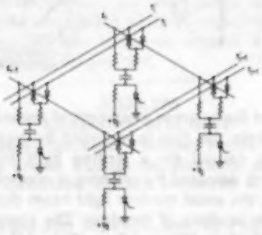
Metalized row and column access circuits for an integrated circuit memory chip each includes crossunders to accommodate intersecting circuits along about half of the extent of such circuit on the chip and no crossunders for the remainder of its extent. The distribution of crossunders along each circuit is such that the bulk of the included crossunders are in the part of the circuit more remote from the circuit-driving point than is the part which is essentially free of crossunders. Metalized bit circuits for the chip are arranged so that they always extend physically parallel to access circuit parts which are free of crossunders so that the bit circuits are entirely free of crossunders. Schematic and actual layouts for a cell used in such a memory chip are shown.

3,638,203

RANDOM ACCESS SOLID-STATE MEMORY USING SCR'S

Arvindkumar M. Patel, Wappinger Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 30, 1969, Ser. No. 846,123
Int. Cl. G11c *7/00, 11/34*
U.S. Cl. 340—173 **7 Claims**



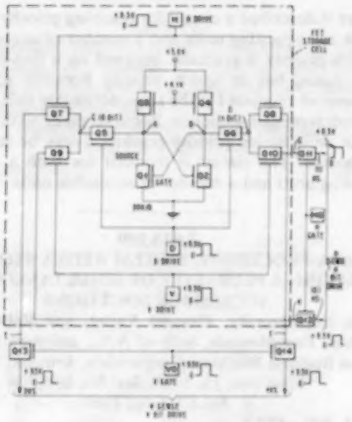
A memory array comparable to a core memory may be built up by use of a low-power silicon-control rectifier as the bistable element in each memory cell. In the preferred embodiment the gate of the low-power SCR is not used, and the four-layer device is referred to as a trigger diode. The trigger diode is driven into a high-conductance state by exceeding the breakover voltage and into a low-conductance state by dropping the current below the holding current. During the high-conductance state, the holding current is guaranteed by a bias circuit directly connected to the anode of the trigger diode. The diode is switched from one bistable state to the other by transient voltages generated in an adjoining circuit. The transients are coupled to the trigger diode by a capacitor. Both the read and write operation are half-select operations so that a single memory cell may be selectively written to a "1" or to a "0" stable state. Readout is accomplished by half-select driving one coordinate and monitoring the drive line on the orthogonal coordinate.

3,638,204

SEMICONDUCTIVE CELL FOR A STORAGE HAVING A PLURALITY OF SIMULTANEOUSLY ACCESSIBLE LOCATIONS

Eugene Kolankowsky, Pleasant Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1969, Ser. No. 886,509
Int. Cl. G11c *11/40;* **H03k** *3/286*
U.S. Cl. 340—173 FF **14 Claims**



A storage cell especially suited for use in an array of cells wherein cells may be simultaneously accessed by a plurality of different addressing systems for reading and writing of information via independent sensing and bit driving devices. A latch, constructed from field effect transistors (FET) in a known manner, is selected for accessing by driver lines, retaining and indicating information in accordance with signals supplied on a sense bit driver line pair. The number of drivers required to select the cell and the number of sense bit driver line pairs are increased by providing additional FET devices to gate, in accordance with selected driver signals, information between the latch and sense bit driver line pairs selected in accordance with the relative locations of information simultaneously accessed in the array.

3,638,205

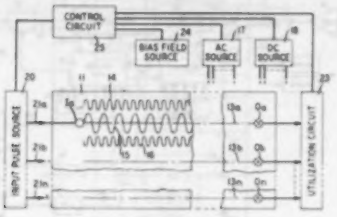
MAGNETIC DOMAIN PROPAGATION ARRANGEMENT

John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 29, 1970, Ser. No. 50,568
Int. Cl. G11c *19/00, 11/14*
U.S. Cl. 340—174 TF **7 Claims**

A single electrical conductor to which an AC signal is applied causes oscillation of a single wall domain in a substrate

of magnetic material in which such domains can be moved. The presence of a DC current in auxiliary conductors to either side converts the oscillation to displacement along the



axis of the single conductor. A reversal of the polarity of the DC currents reverses the direction of displacement of domains.

3,638,206

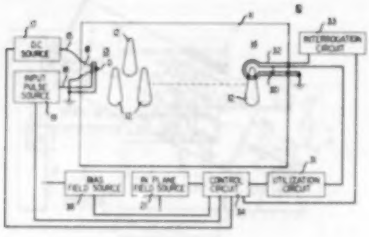
DOMAIN PROPAGATION ARRANGEMENT

Alfred Almstedt Thiele, East Orange, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 8, 1970, Ser. No. 35,747

Int. Cl. G11c *19/00, 11/14*

U.S. Cl. 340—174 TF **13 Claims**



Single wall domains are moved in a slice of magnetic material by changing magnetic pole patterns in a soft magnetic overlay in response to a magnetic field reorienting in the plane of the slice. Several overlay geometries are described for achieving improved operation and for a fuller utilization of the potential of presently available photolithographic techniques.

3,638,207

MAGNETIC DEVICES

David H. Smith, Lebanon Township, Hunterdon County, and Le Grand G. Van Uitert, Morris Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 17, 1969, Ser. No. 877,368

Int. Cl. G11b *5/62*

U.S. Cl. 340—174 TF **4 Claims**

Partial substitution of small amounts of cobalt in a class of materials, sometimes referred to as hexagonal ferrites, produces marked changes in anisotropy. This, in turn, results in an increase in domain wall mobility or in other characteristic changes of device interest. A leading class of such devices is known as "bubble" or single-wall domain devices.

3,638,208

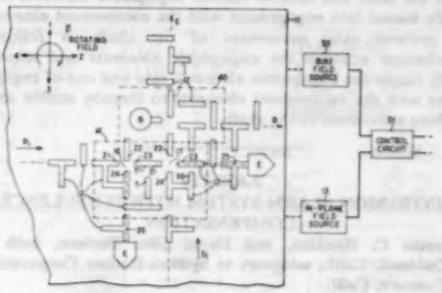
MAGNETIC DOMAIN LOGIC CIRCUIT

Woo Foung Chow, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 15, 1970, Ser. No. 46,126

Int. Cl. G11c *21/00, 11/14*

U.S. Cl. 340—174 TF **7 Claims**



A magnetic domain logic circuit is realized by designing a magnetically soft overlay to advance domains along a first or second channel depending on domain interactions. The presence or absence of a control domain for effecting the interaction is determined by the movement of a single control domain.

3,638,209

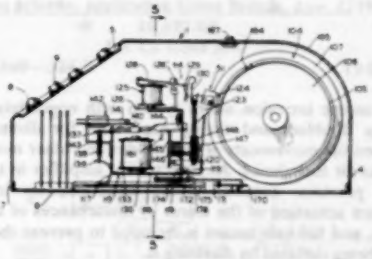
ESCAPEMENT MECHANISMS

Richard K. Snook, Bridgeton, Mo., assignor to Research Systems Corporation, Bridgetion, Mo.

Original application Dec. 22, 1967, Ser. No. 692,975. Divided and this application Apr. 9, 1970, Ser. No. 27,096

Int. Cl. G11b *21/08*

U.S. Cl. 340—174.1 C **16 Claims**



Escapement mechanisms for use with apparatus having a reading member, such as a reading head, and a record member such as a magnetic storage device and which members are shiftable relative to each other. In one embodiment of the apparatus, the escapement mechanism carries a reading head on a support member which is shiftable longitudinally relative to a base member. A ratchet means enables intermittent shifting of the support member and the reading head along the base so that the reading head is sequentially positioned with respect to various adjacent elements on the storage member. A first solenoid actuable member is connected to the ratchet-type means for actuating the ratchet-type means upon receipt of a first control signal. A shifting member is also located on the base means for intermittently shifting the head in a second direction toward and away from the storage member. The second solenoid actuable member

is capable of actuating the shifting means upon receipt of a second control signal. A mechanism is provided for causing the head to shift toward and away from the storage member immediately upon termination of the shifting of the support member longitudinally with respect to the storage member. A second escapement mechanism is provided for shifting the storage member with respect to the reading head and includes a shaft retaining the storage member and enabling rotation of the storage member with respect to a base member. A plurality of escapement elements are associated with the shaft and receive various engageable elements normally biased into engagement with the escapement elements to prevent axial movement of the shaft. A follower mechanism controls the engageable elements and sequentially biases the engageable elements into and out of engagement with the escapement elements to thereby enable axial shifting movement of the shaft.

3,638,210

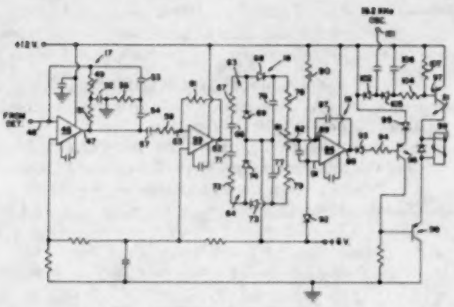
INTRUSION ALARM SYSTEM WITH TURBULENCE COMPENSATION

Thomas C. Hankins, and David Glen Barleen, both of Oakland, Calif., assignors to Systron-Donner Corporation, Concord, Calif.

Filed June 26, 1970, Ser. No. 50,233

Int. Cl. G08b *13/18*

U.S. Cl. 340—258 A **8 Claims**



Ultrasonic intrusion alarm system with oppositely phased voltage doublers and timing capacitors for distinguishing between the movements of an intruder and other movements such as air turbulence. An operational amplifier in the input stage provides common mode rejection; an integrator prevents actuation of the alarm by disturbances of short duration, and fail-safe means is included to prevent the system from being deflated by disabling it.

3,638,211

CRANE SAFETY SYSTEM

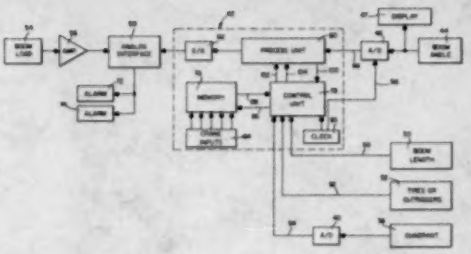
Albert A. Sanchez, Wilmington, Mass., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 8, 1969, Ser. No. 864,728

Int. Cl. B66c *15/00*

U.S. Cl. 340—267 **12 Claims**

A system is shown for warning the operator of a crane when the crane is about to overturn due to the moment of a heavy load or when the weight of that load could cause structural failure of the crane. Sensors for measuring the boom length, boom angle, condition of the crane support, and the quadrant in which the crane is operating are connected to the crane and apply signals to a computer which selects previously stored information from a memory unit depending on the signals received. This stored information is applied to a comparator which compares the stored signal against a



measured load signal and provides a warning alarm to the crane operator when the two signals approach each other.

3,638,212

OVERLOAD SAFETY DEVICE FOR JIB CRANES

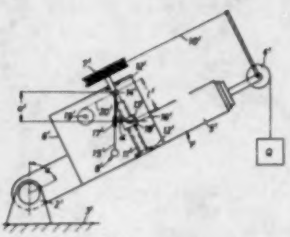
Kurt Peter, Karlsruhe; Gerd Huhne, Morsch; Harald Kauer; Knud Overlach, both of Karlsruhe, and Volker Schlicker, St. Georgen, all of Germany, assignors to Ludwig Pietzsch, Karlsruhe, Germany

Filed Oct. 14, 1969, Ser. No. 866,338

Claims priority, application Germany, Oct. 16, 1968, P 18 03 457.6; Nov. 23, 1968, P 18 10 639.3; Jan. 24, 1969, P 19 03 493.6

Int. Cl. G08b *21/00*

U.S. Cl. 340—267 C **22 Claims**



Overload safety device for jib cranes includes means for measuring a crane jib working radius, a multiple tapped potentiometer having a coil, input leads to the coil, and a slider, means for transferring the jib working radius measurement to an angular movement of the slider, means for supplying an independently adjustable voltage to each of the input leads of the potentiometer coil, load measuring means for producing an output voltage corresponding to a given load carried by the jib, means for comparing the output voltage of the potentiometer and the output voltage of the load measuring means, and means for releasing an overload signal when the output voltages of the potentiometer and the load measuring means are equal.

3,638,213

ELECTRICAL ALARM SYSTEM

Glenn C. Dagle, 24844 Pennie Road, Dearborn Heights, Mich.

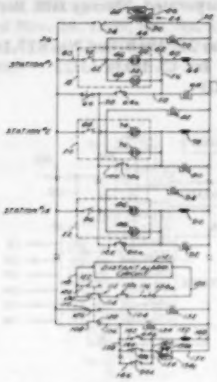
Filed Dec. 17, 1969, Ser. No. 885,733

Int. Cl. G08b *13/18*

U.S. Cl. 340—280 **9 Claims**

The electrical alarm system is particularly adapted for use in connection with banks to sound an alarm during a bank robbery. The alarm system includes a photocell device which is positioned beneath a stack of treasury bills located in a money compartment at a teller's cage. Removal of the entire

stack of bills by a teller in response to the demand of a bank robber exposes the photocell to light rays whereupon the



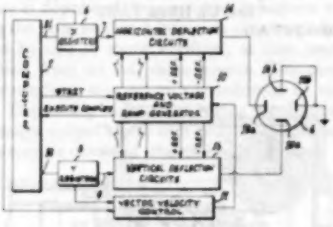
photocell is energized and triggers an alarm system to apprise security forces of the existence of the emergency.

3,638,214

VECTOR GENERATOR

Howard Mulder Scott, Morrestown, and Carl Rutherford Corson, Trenton, both of N.J., assignors to RCA Corporation

Filed Jan. 23, 1970, Ser. No. 5,229
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **8 Claims**



Complementary ramp waves are generated which extend between first and second direct-current levels. During successive time intervals, multiple digit binary words are generated defining the horizontal and vertical components of the vector being generated. Registers store the binary words, and gates respond to the stored digits for controlling a plurality of switches which select for each digit one of the complementary ramp waves or the direct-current levels, depending on whether or not a digit has changed value during the preceding time interval. A sum wave is obtained for each component of the vector by adding the selected waves with weights dependent on the power of two represented by a particular digit. The sum waves serve as deflection waveforms for the respective deflection means of the cathode-ray tube.

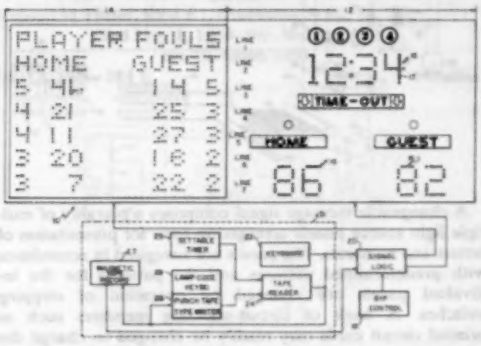
3,638,215

DISPLAY SYSTEM WITH SOLID MATRIX DISPLAY BOARD

Robert A. Payne, Des Plaines, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed May 28, 1970, Ser. No. 41,310
Int. Cl. G09f *13/00*
U.S. Cl. 340—324 R **8 Claims**

Display system utilizing a solid matrix display board having a plurality of display lines each of which is made up of lamps arranged in vertical columns and horizontal rows, the display lines and display element columns being locatable by address code data. A shift register is associated with each row, and each storage stage thereof is sequentially related to a lamp in the row. The control circuits for the system select a display line indicated by the input data and the encoded signals for desired data characters are shifted through the shift register



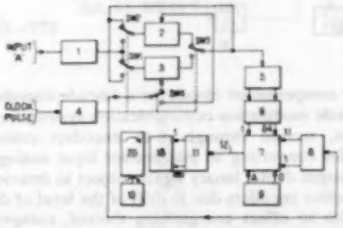
to a desired column location indicated by the input data. Cycling means are provided to enable changing any display character on a board by addressing the line and column of the character to be changed. Provisions are also made for selectively forming the encoded signal and bypassing an input data to encoded signal converter to provide random access to any displayed element on the board.

3,638,216

CHARACTER GENERATION SYSTEM

Arthur Edward Brewster, Cheshunt, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 24, 1969, Ser. No. 809,896
Claims priority, application Great Britain, Apr. 4, 1968, 16,157/68
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 R **19 Claims**



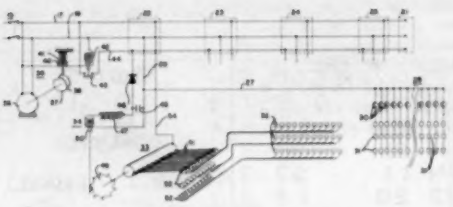
The invention provides a character generation system for converting input data signals into driving signals for a full-page-width mosaic printer or display. The number of columns of a storage matrix which are scanned during the generation process is determined by the character set into the matrix; thus the length of line occupied by a character is determined by the size of the character.

Facilities for line justification and the generation of bold, italic and varying-size characters are also outlined.

3,638,217
CHANGEABLE CHARACTER DISPLAY SYSTEM

Eldon L. Sutherland, Grand Junction, Colo., assignor to Benjamin L. Noel, Uniontown, Ala.

Filed Sept. 5, 1968, Ser. No. 757,692
Int. Cl. G09f 9/34
U.S. Cl. 340—336 5 Claims

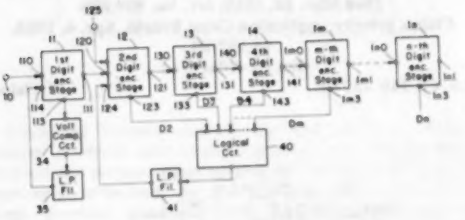


A changeable message signal comprises a plurality of multiple light source panels arranged in rows for presentation of letters and numerals. The panels are energized in accordance with predetermined patterns and the patterns for the individual panels are changed by operation of stepping switches. A bank of circuit-selecting members such as printed circuit cards may readily be changed to change the information on the panels and each position of the stepping switches energizes a different set of the members to provide a multiplicity of messages in turn.

3,638,218
DRIFT COMPENSATION SYSTEM FOR A CASCADE-TYPE ENCODER

Haruo Kaneko, and Yoshio Katagiri, both of Tokyo, Japan, assignors to Nippon Electric Company, Tokyo, Japan

Filed Aug. 31, 1970, Ser. No. 68,069
Claims priority, application Japan, Nov. 1, 1969, 44/88259
Int. Cl. H03k 13/02
U.S. Cl. 340—347 CC 6 Claims

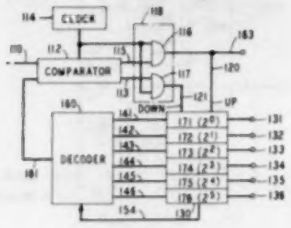


A drift compensation circuit for a cascade encoder used in a pulse code modulation communication system, including at least first, second through *m*-th encoders connected in cascade for converting an intermittent input analogue signal into an output digital binary signal subject to deterioration in the respective encoders due to drift of the level of direct current utilize to effect energization thereof, comprising first feedback means connected to the first encoder for providing an output of zero level while the input analogue signal is absent therefrom, a reference analogue signal of predetermined level supplied to the second encoder, and second feedback means comparing the levels of digital analogue signals derived from the respective second through *m*-th encoders and corresponding to the reference analogue signal with a predetermined reference digital binary signal representing the reference analogue signal to provide a signal to activate the second encoder to adjust the levels of the derived digital binary signals to coincide with the level of the reference digital binary signal.

3,638,219
PCM CODER

David A. Harms, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 23, 1969, Ser. No. 827,261
Int. Cl. H03k 13/22
U.S. Cl. 340—347 AD 4 Claims

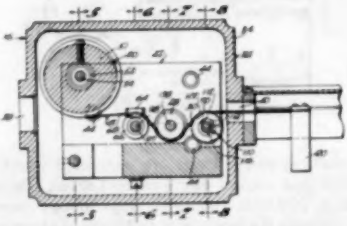


A delta modulator converts an analog signal into a PCM code and also provides a corresponding delta modulated signal. The modulator includes a bidirectional counter in its feedback path which counter stores a code corresponding to the sequence of sampled delta modulated signals. The stored code is converted into an analog feedback signal and a PCM code is derived from the counter outputs.

3,638,220
FORCE-BALANCING MEANS FOR A LINEAR TAPE TRANSDUCER

Jay T. Malina, and Mitchell Tress, both of Miami Beach, Fla., assignors to Anilam Electronics Corporation, Hialeah, Fla.

Filed Sept. 15, 1969, Ser. No. 858,003
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD 13 Claims



This invention pertains to a linear tape transducer including a force-balancing means to balance the forces on a measuring roller, carried by a pulse generator, having a spring-tempered measuring tape partially wrapped around said measuring wheel. The linear tap transducer includes a retractable-type of spring-tempered measuring tape and converts the mechanical movement of a movable member of a machine tool into electric pulses which are, in turn, converted into numbers, illuminated on a display unit for visual observation by the operator, to indicate the amount of movement of said movable member. The force balancing means consists generally of a pair of guide rollers for the measuring tape with the measuring roller disposed therebetween. The result of the force balancing being to achieve a minimum resultant force on the axis of the measuring pulse generator.

One of the guide rollers is adjustable whereby the path of the measuring tape may be varied as it passes partially around each of the guide rollers and the measuring roller to compensate for minute variations in the mounting of the various components.

3,638,221

SOLID-STATE KEYBOARD

Victor M. Bernin, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,220
Int. Cl. H03k 17/02
U.S. Cl. 340—365 9 Claims

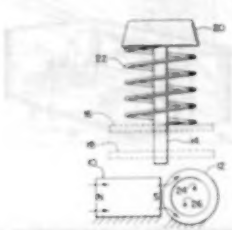
The disclosure describes solid-state keyboards employing a saturable magnetic core switch for each key. Each key has a keystem of magnetic material, the keystem having legs extending on opposing sides of the core. Two permanent magnets are attached to the keystem. When a key is not depressed, the magnets are located adjacent opposing sides of the core so that a flux path is formed through the core, the keystem, and the two magnets, to thereby saturate the core. When a key is depressed, the permanent magnets are moved away from the core so that it becomes unsaturated. The core is threaded by one or more windings, at least one of them being excited from an AC drive source. The core and its winding or windings may act as a transformer or variable inductance. Depending upon the wiring configuration employed, a single output signal or a coded combination of output signals may be obtained when a key is actuated.

3,638,222

FLUX GATE SWITCH

Victor M. Bernin, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,219
Int. Cl. H03k 17/02
U.S. Cl. 340—365 13 Claims



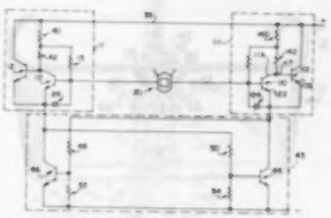
This disclosure describes a solid-state magnetic switch such as that used in keyboard devices. The switch includes a keystem of magnetic material, a magnetic core, and a permanent magnet adjacent the magnetic core. When the keystem is not depressed, the flux from the magnet saturates the core. When the keystem is depressed, it moves adjacent the permanent magnet and provides a flux path which switches the saturating flux from the core. The core may function as either a transformer or a variable inductor. A plurality of the switches may be incorporated in a keyboard with either a coded or noncoded output, the coding being accomplished by selective threading of the cores with one or more windings.

3,638,223

OSCILLATOR MEANS FOR DRIVING A RESONANT LOAD

Bronson M. Potter, RFD # 1, Greenville, N.H.

Filed May 1, 1969, Ser. No. 820,890
Int. Cl. G08b 3/00
U.S. Cl. 340—384 E 4 Claims



Improvements in sonic alerting devices of the type controlled by the natural frequency of the transducer are shown as well as improved circuits for driving loads in general. Efficient drive circuits suited for but not limited to integrated circuit chips employ transistors connected in the common collector-common base configuration. Very efficient quasisymmetrical circuits are shown employing cross coupled transistors in place of inefficient resistors.

Bridge oscillators are shown in which the transducer controls the frequency of oscillation and in which the voltage driving the transducer is nominally twice the supply voltage. There are circuits made of two sets of elements and each set compels the other to oscillate at opposite phase with additive effect in powering the transducer.

3,638,224

STACKED ARRAY OF OMNIDIRECTIONAL ANTENNAS

Marion C. Bailey, Blacksburg, and William F. Croswell, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Apr. 24, 1970, Ser. No. 31,703
Int. Cl. H01q 13/10
U.S. Cl. 343—771 3 Claims

A stacked vertically polarized collinear array of a plurality of independently fed omnidirectional antennas operating at

different frequencies. Each antenna consists of an array of five circumferential slots in the outer conductor of a dielectric filled shorted coaxial transmission line with a hollow center conductor for feed leads to pass through.

3,638,225

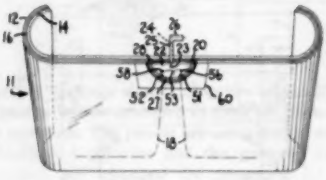
ANTENNA WINDSHIELD

Rodger V. Zawodniak, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 773,805, Nov., 1968, now Patent No. 3,543,272. This application Aug. 13, 1970, Ser. No. 63,362

Int. Cl. H01q 1/32

U.S. Cl. 343—713 5 Claims



An improved antenna for a laminated windshield comprising two glass sheets, one of which has a notched portion in its lower edge portion and a single continuous antenna wire mounted in a plastic interlay that adheres the two glass sheets together. The wire has its central portion exposed for electrical connection within the notched portion to a metal tab electrically connected to a radio receiver. The notched portion is filled with an electrical insulating material, such as polysulfide resin, enclosed on one side with a transparent tape of electrical insulation material, such as polyurethane or polyethylene.

3,638,226

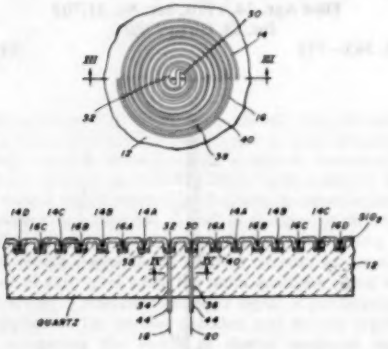
PLANAR-TYPE SPIRAL ANTENNA

Charles G. Brooks, Kingsville, and Noel C. Peterson, Severna Park, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 10, 1970, Ser. No. 53,798

Int. Cl. H01q 1/36, 1/40

U.S. Cl. 343—895 7 Claims



A planar-type spiral antenna assembly capable of handling higher input powers than prior art planar antennas and enabling greater ranges of a radiated beam of electromagnetic wave energy. This is accomplished by recessing the spiral convolutions of conductive material forming the antenna into corresponding spiral slots formed in a dielectric disc having a high-dielectric strength, the disc being formed from a material such as quartz or alumina. The spiral convolutions of conductive material, recessed within the aforesaid slots, are preferably covered with a dielectric material such as silicon monoxide or silicon dioxide to further increase the dielectric constant in the space between adjacent conductors.

3,638,227

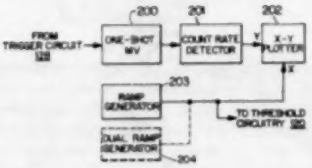
AUTOMATIC THRESHOLD PLOTTER

Henry R. Angel, Trumbull, Conn., assignor to General Science Corp., Bridgeport, Conn.

Filed Apr. 28, 1970, Ser. No. 32,524

Int. Cl. G01d 9/40; G06m 11/00

U.S. Cl. 346—1 6 Claims



An automatic threshold plotter for use with a particle-counting system in which, during a single analytical run, a plot is provided of particle count rate as a function of threshold voltage from which particular threshold settings can be readily determined.

3,638,228

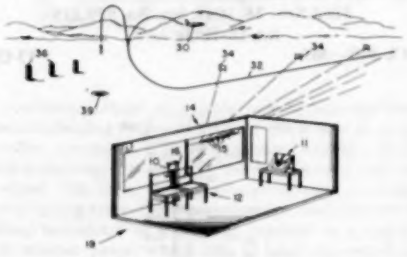
AIRCRAFT RANGE PLOTTING MEANS

Everett B. Hill, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 4, 1969, Ser. No. 882,074

Int. Cl. G01c 21/22

U.S. Cl. 346—8 4 Claims



This invention involves the instrumentation necessary for training aircraft pilots in bombing techniques. The essential elements of the system are a flight-profile plotter, an optical tracker, three impact-spotting quadrants, an impact-spotting board, and a timing console. When the training includes dive bombing and conventional-weapons delivery, optical acquisition and radar acquisition systems are added. This equipment measures the aircraft's speed and flight path while it performs weapons delivery maneuvers.

3,638,229
TIME-RECORDING APPARATUS

Thomas J. Schinner, Cincinnati, Ohio, assignor to The Cincinnati Time Recorder Company, Inc., Cincinnati, Ohio

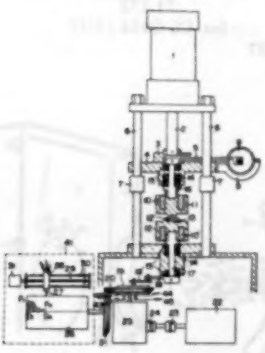
Filed Feb. 5, 1970, Ser. No. 8,822
Int. Cl. G07c *1/30*
U.S. Cl. 346—24 8 Claims

A time-recording apparatus and system for automobile parking garages in which there is provided an "in" clock and "out" clock, the two clocks synchronized with one another to provide a printed ticket which indicates arrival time ("in" clock) and a record of the time of departure ("out" clock) with the parking rate and corresponding charge automatically printed on the ticket for payment to the cashier.

3,638,230
APPARATUS FOR MEASURING DYNAMIC LOSS ANGLE

Masashi Umeno, Kawasaki; Shiro Yabuta, Yokohama, and Takashi Nishida, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed June 24, 1970, Ser. No. 49,486
Claims priority, application Japan, June 27, 1969, 44/50366
Int. Cl. G01n *25/02*
U.S. Cl. 346—33 R 2 Claims

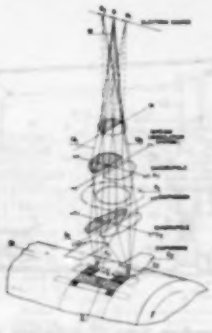


The dynamic loss angle of rubber or plastic materials is measured with simplicity by using a vibration-type cure meter such as curelastometer, wherein the moment the deformation of a specimen of the rubber or plastic materials is ±0 and the moment the torque of the specimen is ±0, electric current is caused to flow in an event marker moving against the peripheral surface of a rotary drum adapted to rotate in synchronous relation with the vibration of the tester, whereby pulses are recorded on the rotary drum.

3,638,231
DEVICE FOR RECORDING WITH ELECTRON RAYS

Jan B. Le Poole, Delft; Leendert A. Fontijn, Maasdijk, and Alfred B. Bok, Berkel, all of Netherlands, assignors to Nederlands Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed May 26, 1969, Ser. No. 827,510
Claims priority, application Netherlands, May 27, 1968, 6807439
Int. Cl. B23k *15/00*; G01d *15/04*; G11c *13/00*
U.S. Cl. 346—74 EB 13 Claims

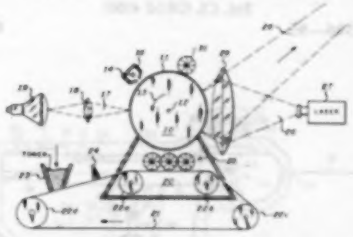


A device is disclosed for recording image elements, by exposing recording material, at constant current density with the aid of a focused electron beam provided with means before the last focusing device for varying the shape and/or size, in the recording plane, the cross section of the electron beam in conformity with image signals.

3,638,232
REAL-TIME COHERENT OPTICAL PROCESSOR

Donald Howland McMahon, Carlisle, and William Thomas Maloney, Sudbury, both of Mass., assignors to Sperry Rand Corporation

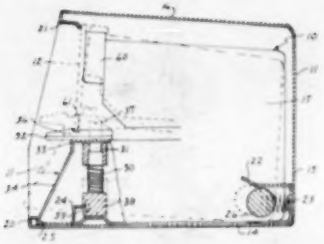
Filed Jan. 23, 1970, Ser. No. 5,437
Int. Cl. G03g *15/04*; G01d *15/06*
U.S. Cl. 346—74 CR 4 Claims



A coherent optical processor comprising writing, developing, readout and erasing stations disposed proximate to and consecutively spaced along the direction of motion of a rotatable drum having a photoconductive layer affixed thereto. A time-varying signal is written on the photoconductive layer by first establishing a uniform electrostatic charge thereon and then applying a light beam to spatially modulate the electrostatic charge pattern in accordance with time-amplitude variations of the light beam. Next it is exposed to a cloud of toner particles at the developing station whereat the spatially distributed electrostatic charge pattern is converted to a visible image of varying transparency. Optical processing

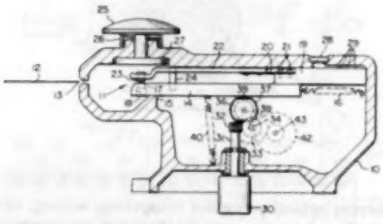
is performed as the visible image passes the readout station where it intersects a laser beam and thereafter the toner image is erased from the tape in readiness for the next cycle of operation commencing at the writing station.

3,638,233
TIME CARD RECORDER
Menachem Futter, Jamaica, N.Y., assignor to Heat Timer Corporation, New York, N.Y.
Filed July 8, 1969, Ser. No. 839,836
Int. Cl. G07c *1/06*
U.S. Cl. 346—82 **4 Claims**



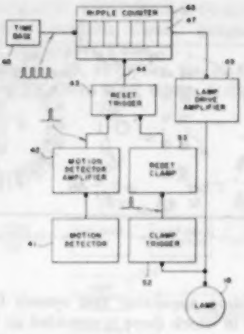
A device for recording time of initiation and ending of work periods commonly referred to as a "timeclock" and more particularly certain features of a timeclock. A timeclock should be a precise timing device and safely guarded from any tampering or false recording, therefore in this instance, the timeclock is housed in a foolproof locked housing into which the device is inserted easily, quickly and ready for immediate use or as easily removed by authorized personnel. The timeclock is also provided with mechanized card-handling features to remove the human element, that is, the card when inserted in a slot in the housing is automatically gripped and moved to processing and returned duly processed.

3,638,234
QUANTITY RECORDER
James R. Fiannaca, Rochester, N.Y., assignor to Metrix Data Systems, Inc., Rochester, N.Y.
Filed Feb. 24, 1969, Ser. No. 801,638
Int. Cl. G01d *4/00*
U.S. Cl. 346—95 **6 Claims**



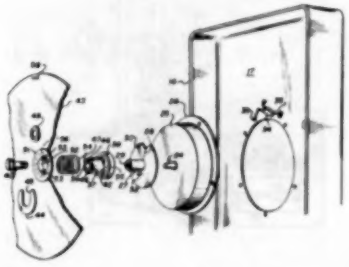
A quantity recorder advances punch sets repeatedly at different rates from the beginning to the end of respective paths as a function of the quantity measured and includes means for operating the punch sets to punch their path positions into a card to record the quantity. Recorders other than punch sets can also be used, and the device is useful for recording the quantities measured by utility meters.

3,638,235
BOREHOLE TOOL
James M. Lindsey, Houston, Tex., assignor to Sperry Sun Well Surveying Company, Sugar Land, Tex.
Filed Apr. 2, 1970, Ser. No. 25,003
Int. Cl. E21b *47/022*
U.S. Cl. 346—107 W **7 Claims**



The particular embodiment described herein as illustrative of one form of the invention utilizes a motion-sensing device to control the operation of a timing circuit in a downhole borehole tool. The absence of motion for a predetermined period is indicative of the tool being at its operating position and permits an electronic counting circuit to initiate signals for operating the tool. Once the tool has operated, the circuit incorporates means for preventing further operation of the tool until the circuit is reset at the surface.

3,638,236
CHART-CHANGING APPARATUS
Bobby D. Adams, El Paso, Tex., assignor to Texas Instrument Engineers, Inc., Houston, Tex.
Continuation of application Ser. No. 797,116, Feb. 6, 1969, now abandoned. This application Sept. 10, 1970, Ser. No. 71,272
Int. Cl. G01d *15/32*
U.S. Cl. 346—137 **27 Claims**



This chart-changing apparatus includes an arbor which is mounted by a central locking screw on a hub attached to the chart drive motor of a recorder. The arbor is provided with flats or splines on opposite sides and an abutment ring at the outer end, while a series of charts having central holes and an interspaced series of washers having slots at one side engageable with the splines are mounted on the arbor, with the outermost washer engaging the abutment ring. The charts and washers are held in position by a spring pushing against a chart disc which rotates with the arbor and is keyed thereto

for longitudinal movement. When a pusher is actuated to engage the outermost chart, through a microswitch having a cam follower which will engage a notch in the rear flange of the hub when the arbor is rotated so that the washer slots are uppermost, the outermost washer will drop from the arbor and then the outermost chart will drop off the end of the arbor. The remaining washers are held between the charts by the spring and against the abutment. A series of charts and washers sufficient for a period, such as one month, are mounted on an arbor for replacement of an arbor from which the charts have been removed, by the same central locking screw.

3,638,237

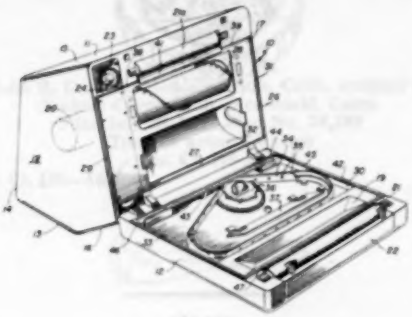
ELECTRICAL RECORDER UTILIZING A CHEMICALLY-TREATED WEB

Milton Alden, Needham, Mass., assignor to Alden Research Foundation, Brockton, Mass.

Continuation of application Ser. No. 595,778, Nov. 21, 1966, now abandoned. This application Aug. 15, 1969, Ser. No. 852,968

Int. Cl. G01d *15/06, 15/20*

U.S. Cl. 346—145 **2 Claims**



This invention relates to a recorder and, more particularly, to apparatus arranged to receive electrical signals and convert them to visible indicia on a chemically-treated web, means being provided to prevent the drying of the web.

3,638,238

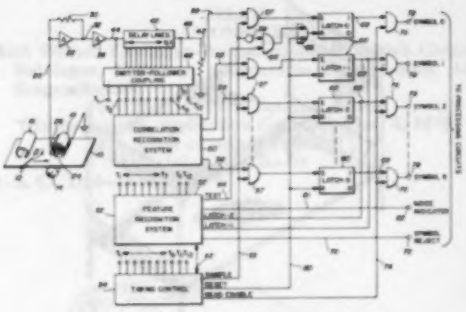
MAGNETIC INK SYMBOL RECOGNITION SYSTEM WITH WAVESHAPES REPRESENTING DIRECT MAGNETIC FLUX

Richard E. Milford, and Leland J. Hanchett, Jr., both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc.

Filed Aug. 12, 1969, Ser. No. 849,485

Int. Cl. G06k *9/00*

U.S. Cl. 340—146.3 C **17 Claims**



A magnetic ink symbol recognition system for deriving characteristic waveshapes representing the total quantity of ink in each symbol thereby accurately recognizing symbols having printing imperfections.

DESIGNS

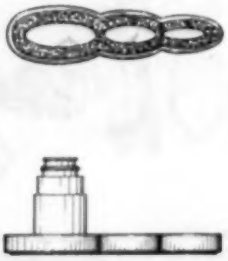
JANUARY 25, 1972

222,871
BUNK BED
Egbertus J. Diks, Uden, Netherlands, assignor to Diks & Coenen N.V. Uden, Netherlands
Filed Mar. 19, 1970, Ser. No. 21,967
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4

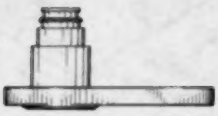
222,872
SPANNER
Guy Boucher, Paris, France, assignor to E.F.E. (European Fund Establishment), Vaduz, Liechtenstein
Filed June 10, 1970, Ser. No. 23,426
Claims priority, application France Dec. 26, 1969
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—22

222,873
CABINET KNOB
Richard C. J. Palson, Medfield, Mass., assignor to P.X. Industries, Inc., Rockland, Mass.
Filed Sept. 15, 1970, Ser. No. 25,011
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—145

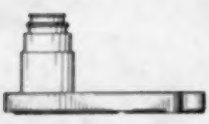
222,874
DOOR LEVER
John R. Gerlach, Monterey Park, Calif., assignor to Emhart Corporation, Bloomfield, Conn.
Filed July 29, 1970, Ser. No. 24,197
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—162



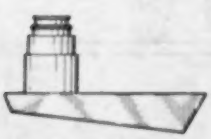
222,875
DOOR LEVER
John R. Gerlach, Monterey Park, Calif., assignor to Emhart Corporation, Bloomfield, Conn.
Filed July 29, 1970, Ser. No. 24,198
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—162



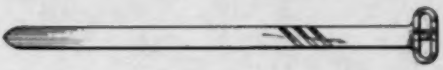
222,876
DOOR LEVER
John R. Gerlach, Monterey Park, Calif., assignor to Emhart Corporation, Bloomfield, Conn.
Filed July 29, 1970, Ser. No. 24,199
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—162



222,877
DOOR LEVER
John R. Gerlach, Monterey Park, Calif., assignor to Emhart Corporation, Bloomfield, Conn.
Filed July 29, 1970, Ser. No. 24,200
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—162

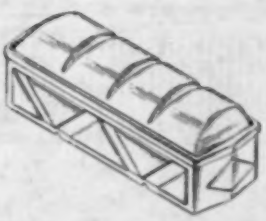


222,878
BUNDLING STRAP
Richard S. Schwartz, Union, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Mar. 17, 1970, Ser. No. 21,929
Term of patent 14 years
Int. Cl. D9—*06*
U.S. Cl. D9—252



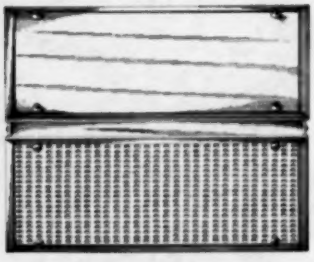
222,879
AUTOMOBILE
Karl Wilfert, Gerlingen-Waldstadt, and Friedrich Geiger, Boblingen, Germany, assignors to Daimler-Benz Aktiengesellschaft
Filed Sept. 4, 1970, Ser. No. 24,853
Claims priority, application Germany Mar. 4, 1970
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3

222,880
BURIAL VAULT
John R. Madlem, Box 136A3, High Falls Road, R.D. 1, Catskill, N.Y. 12414
Filed Nov. 19, 1970, Ser. No. 26,073
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D19—1

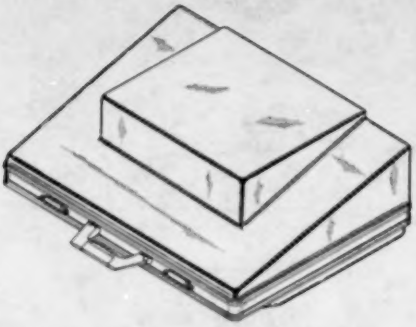


222,881
WEIGHT FORWARD TAPERED FLY FISHING LINE
Leon L. Martuch, Midland, Mich., assignor to Scientific Anglers Inc., Midland, Mich.
Filed May 1, 1970, Ser. No. 22,775
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—99

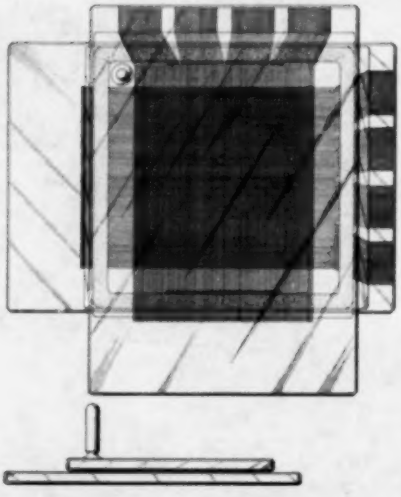
222,882
COMBINED PEG, MAGNETIC AND CHALK BOARD
Wesley E. Sharer, Chicago, Ill., assignor to Playskool, Inc., Chicago, Ill.
Filed Aug. 19, 1970, Ser. No. 24,576
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1



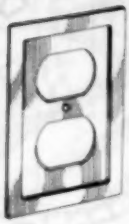
222,883
DATA TERMINAL
Lawrence Levow, Dix Hills, and Carl Yurdin, Port Washington, N.Y., assignors to Acrodyne, Inc., Clifton, N.J.
Filed June 30, 1970, Ser. No. 23,757
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

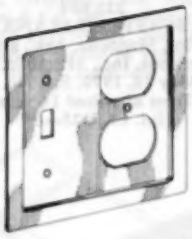


222,884
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Gerald E. Wojcik, 4619 282nd St., Toledo, Ohio 43611
Filed Aug. 7, 1970, Ser. No. 24,379
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—5

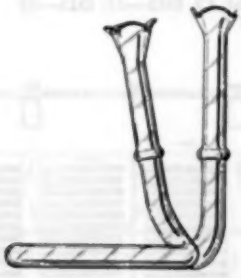


222,885
ELECTRIC OUTLET BOX COVER PLATE
Earl E. Smith, Charlevoix, Mich., assignor to Lexalite Corporation, Charlevoix, Mich.
Filed Mar. 30, 1970, Ser. No. 22,117
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

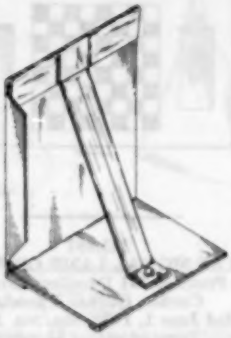




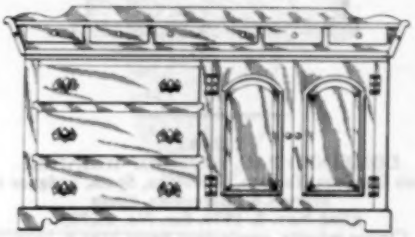
222,886
VASE FOR FLOWERS OR THE LIKE
Loyal F. Miner, Norco, Calif., assignor of a fractional part interest to Robert T. Ebninger, Huntington Beach, Calif.
Filed June 22, 1970, Ser. No. 23,581
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—28



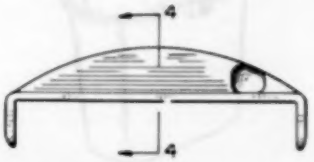
222,887
BOOK END
Charles E. Weyll, Jr., P.O. Box 62, Glen Cove, N.Y. 11542
Continuation-in-part of design application Ser. No. 18,112, July 8, 1969. This application July 14, 1970, Ser. No. 23,946
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3



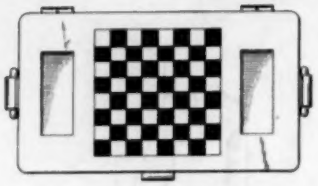
222,888
DRESSER
Oscar Lax, South Orange, N.J., assignor to The Bennington Company, Union, N.J.
Filed Apr. 17, 1970, Ser. No. 22,488
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D33—6



222,889
GOLF PUTTER HEAD
Michael A. Dziurgot, 34242 Azter, Westland, Mich. 48185
Filed June 11, 1970, Ser. No. 22,919
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



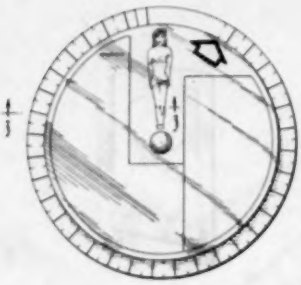
222,890
INSULATED PICNIC CHEST
Robert A. White, Cleveland Heights, Ohio, assignor to The Hamilton-Skotch Corporation, Cleveland, Ohio
Filed Sept. 8, 1970, Ser. No. 24,864
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—1



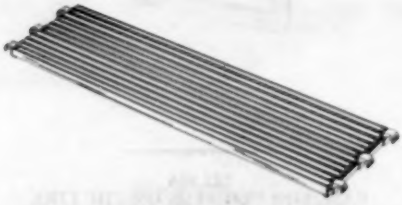
222,891
VEHICLE SIGNAL LAMP OR THE LIKE
Leandre Proteau, 791 Decelles Terrace, Jacques Cartier, Quebec, Canada
Filed June 1, 1970, Ser. No. 23,219
Term of patent 14 years
Int. Cl. D26—*06, 05*
U.S. Cl. D48—32

222,892
COMBINED PAIL AND MOP WRINGER
Juan Gunfaus, Tarrasa, Barcelona, Spain, assignor to Mery S.A., Barcelona, Spain
Filed Nov. 2, 1970, Ser. No. 25,783
Claims priority, application Spain May 8, 1970
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—29

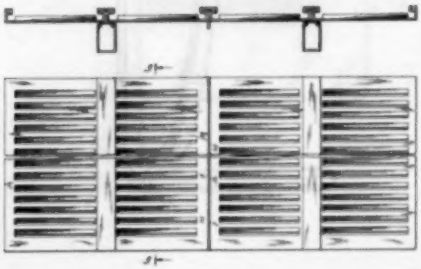
222,893
ROTARY DIET REMINDER DEVICE
Marcel Neumann, 7240 Lowell, Lincolnwood, Ill. 60646, and Burton L. Siegal, Skokie, Ill.; said Siegal assignor to said Neumann
Filed July 15, 1970, Ser. No. 23,952
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—6



222,894
SCAFFOLD PLANK
Charles Polk Taylor, Magnolia, Ark., assignor to Southern Extrusions, Inc., Magnolia, Ark.
Filed May 18, 1970, Ser. No. 23,044
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D54—1



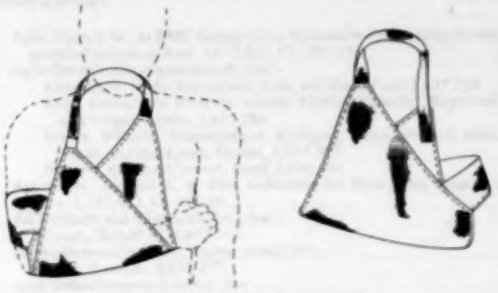
222,895
GRILLE
Patrick Zampetti and Robert Deuchler, Cranford, N.J., assignors to Construction Specialties, Inc., Cranford, N.J.
Filed Mar. 5, 1970, Ser. No. 21,753
Term of patent 14 years
Int. Cl. D25—*02;* D23—*03*
U.S. Cl. D54—2



222,896
CALCULATOR
Chester J. Abend, Camillus, and James H. Frakes, Jr., Manlius, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed Nov. 2, 1970, Ser. No. 25,789
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

222,897
INTRUSION ALARM DEVICE
Maurice Y. White, Overland Park, Kans., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Filed June 1, 1970, Ser. No. 23,215
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1

222,898
ARM SLING
Eleanor R. Morris, 1260 W. 7th Drive, Mesa, Ariz. 85202
Filed July 8, 1970, Ser. No. 23,864
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D83—1



222,899
TIRE
Raymond P. Hawkinson, Jr., Minneapolis, Minn., assignor to Paul E. Hawkinson Company, Minneapolis, Minn.
Filed Mar. 9, 1970, Ser. No. 21,775
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF JANUARY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Vibrasug: *See*—
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Abel, Dennis G., to Zenith Radio Corporation. Luminance amplifier with black level stabilization control. 3,637,921, Cl. 178-5.4

Abella, Isaac D.: *See*—
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Abex Corporation: *See*—
Adams, Cecil E., 3,636,977.

Abraham, Edward D., to Sherwin-Williams Company, The. Foundry mold and core blowing machine. 3,637,191, Cl. 259-153.

Abuls, Dzintars: *See*—
Christie, John B.; Abuls, Dzintars; and Van Breukelen, Wilfridus G.,3,637,993.

Achelpohl, Fritz, to Windmoller & Holscher. Conveying apparatus. 3,636,828, Cl. 93-93.

Ackerman Engravers Inc.: *See*—
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Acton, Daniel D.: *See*—
Risch, William E.; and Acton, Daniel D.,3,637,101.

Adam, Georges Clement. Cable clamping device. 3,638,172, Cl. 339-249.

Adams, Aaron W., Jr.: *See*—
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Adams, Arnold G.: *See*—
Fiddler, Theodore E.; and Adams, Arnold G.,3,637,961.
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Adams, Arthur C., deceased0 (by Adams, Mary; administratrix), to American Home Products Corporation. Process for the preparation of high density N,N'- dibenzyl-ethylenediamine bis[D(-)-a-aminobenzylpenicillin]. 3,637,665, Cl. 260-239.1

Adams, Bobby D., to Tejas Instrument Engineers, Inc., mesne. Chart changing apparatus. 3,638,236, Cl. 346-137.

Adams, Cecil E., to Abex Corporation. Electro-hydraulic flow control circuit. 3,636,977, Cl. 137-608.

Adams, Charles D.: *See*—
Schlatter, Rudolph; and Adams, Charles D.,3,637,733.

Adams, Clarence R.: *See*—
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Sato, Ryuichi; Harimaya, Seizi; Agata, Akihiko; Morishima, Kunio; Tsutsui, Toshiaki; and Kano, Yasuhiro,3,637,329.

Ager, Patrick W., to FMC Corporation. Hydantoin-formaldehyde resin modified polypropylene. 3,637,905, Cl. 260-854.

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Kisselmann, Willy; Rumpelein, Fritz; and Kopf, Paul, 3,637,286.
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Agostinelli, Armand J., to Dart Industries Inc.Dual finish surgeon's glove. 3,637,411, Cl. 117-18.

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Akasaka, Shigeo, to Nippon Kogaku K.K. Automatic film sensitivity setting device. 3,636,847, Cl. 95-31.

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Alden, Milton, to Alden Research Foundation. Electrical recorder utilizing a chemically- treated web. 3,638,237, Cl. 346-145.

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Aldrich, Billy R.; Cooper, Charles R.; and Rasquin, John R., to United States of America, National Aeronautics and Space Administration. Underwater space suit pressure control regulator. 3,636,966, Cl. 137-81.

Aleckner, John F., Jr., to Union Carbide Corporation. Adhesion of coatings to ethylene-polar monomer copolymer. 3,637,428, Cl. 117-138.8

Alert, Jerry George; and Mauldin, Robert Daniel, to Formica Corporation. Decorative laminates carrying removable protective coating. 3,637,408, Cl. 117-6.

Alexander, Roy P.; and Schroeder, Hans Juergen A., to Olin Mathieson Chemical Corporation. Chloro-phosphine-m-carborone and a method of making them. 3,637,836, Cl. 260-543.

Alexeff, Alexander V., to Alexeff-Snyder Enterprises, Inc. Web guiding and spreading apparatus. 3,637,121, Cl. 226-17.

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Alles, David Shepard; Elek, John William; Nevis, Benjamin Edward; and Schlegel, Wallace Albert, to Bell Telephone Laboratories, Incorporated. Automatic focus control for a camera. 3,636,849, Cl. 95-45.

Allied Chemical Corporation: *See*—
Honjoh, Masao L.; and Sifniades, Stylianos, 3,637,816.
Little, Edwin D., 3,637,557.
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Allred, Aubrey M. Baseball batting practice device. 3,637,208, Cl. 273-26.
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Lyle, John P., Jr.; and Towner, Raymond J., 3,637,441.
McKee, Francis G.; and Haddon, Roger C., 3,636,758.
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Amemiya, Hiroshi: *See*—
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Amemiya, Kunio: *See*—
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; Amemiya, Kunio; and Matusaka, Hideki,3,637,427.
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Economou, Peter, 3,637,564.
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Bessant, Glyndwr A. R., to Esso Research and Engineering Company. Increased metallizations of iron ore from fluidized bed processes. 3,637,368, Cl. 75-26.

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Beuscher, Hugh Jacob; Nelson, Donald Robert; Sisson, William Howard; and Toy, Wing Noon, to Bell Telephone Laboratories, Incorporated. Processor for m-out-of-n code words. 3,638,184, Cl. 340-146.1

Beyer, Hermann; and Schoppe, Gunter, to Jenoptik Jena G.m.b.H. Devices for high-contrast imaging of phase- objects in incident-light microscopy. 3,637,280, Cl. 350-13.

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Bimber, Russell M.; and Schuldt, Paul H., to Diamond Shamrock Corporation. Polychloro derivatives of monocarboxy pyridines. 3,637,716, Cl. 260-295.

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Lo Monaco, Sergio; Mazzolini, Corrado; Patron, Luigi; and Moretti, Alberto, to Chatillon-Societa Anonima Italiana per le Fibre Tessili Artificiali S.p.A. Polymerization of vinyl chloride in bulk. 3,637,624, Cl. 260-85.5

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McGrath, Brian Patrick; and Bradshaw, Christopher Patrick Cadman, to British Petroleum Company Limited, The. Process for the preparation of olefins. 3,637,892, Cl. 260-683.

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Young, Noble E. Process and apparatus for treating oil emulsions. 3,637,522, Cl. 252-328.

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Zwight, Daniel H.; and Balogh, Roy, to Mc Cabe-Powers Body Company. Articulated aerial device. 3,637,043, Cl. 182-2.

Zwobada, Rene L.; and Regeffe, Andre Jean, to International Standard Electric Corporation. Reed relay. 3,638,150, Cl. 335-153.

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TO WHOM

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Co.: *See*—
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Layman, Ralph E., to American Cyanamid Co. Dimer acid containing alkyd resinous coating compositions and process of preparing the same. Re. 27,279, 1-25-72, Cl. 260—22.

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Geiger, Friedrich: *See*—
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Smith, Earl E., to Lexallte Corp. Electric outlet box cover plate. 222,885, 1-25-72, Cl. D26—13.

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Wilfert, Karl, and F. Geiger, to Daimler-Benz Aktiengesellschaft. Automobile. 222,879, 1-25-72, Cl. D14—3.

Wojcik, Gerald E. Light emitting gas discharge matrix display panel. 222,884, 1-25-72, Cl. D26—5.

Yurdin, Carl: *See*—
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39R 3,637,406
213 3,637,407

CLASS 108
51 3,636,888
53 3,636,889
60 3,636,890
66 3,636,891
79 3,636,892
111 3,636,893
156 3,636,894

CLASS 109
78 3,636,895

CLASS 110
8R 3,636,896
182.5 3,636,872

CLASS 111
77 3,636,897

CLASS 112
203 3,636,898
207 3,636,899
210 3,636,900
219A 3,636,901
3,636,902

CLASS 113
54 3,636,903

CLASS 114
41 3,636,904
43.5 3,636,905
66.5R 3,636,906
3,636,907
230 3,636,908

CLASS 115
34R 3,636,909
35 3,636,910
70 3,636,911

CLASS 116
28 3,636,912
114R 3,636,913
115.5 3,636,914

124 3,636,915

CLASS 117
6 3,637,408
7 3,637,409
8 3,637,410
18 3,637,411
26 3,637,412
33.5CS 3,637,413
36.2 3,637,414
62 3,637,415
72 3,637,416
76F 3,637,418
76T 3,637,417
93.31 3,637,419
93.42 3,637,420
106R 3,637,423
107 3,637,421
107.2R 3,637,422
118 3,637,424
125 3,637,425
138.8UA 3,637,426
138.8A 3,637,427
138.8E 3,637,428
143A 3,637,429
3,637,430
155UA 3,637,431
161UT 3,637,432
201 3,637,433
3,637,434
227 3,637,435

CLASS 118
8 3,636,916
9 3,636,917
37 3,636,918
48 3,636,919
243 3,636,920
259 3,636,921
264 3,636,922
400 3,636,923
629 3,636,924
637 3,636,925
3,636,926

CLASS 119
1 3,636,927
52 3,636,928

CLASS 122
460 3,636,929

CLASS 123
8.45 3,636,930
32EA 3,636,931
90.55 3,636,932
102 3,636,933
119A 3,636,934
122AB 3,636,935
148E 3,636,936

CLASS 126
19R 3,636,937
30 3,636,938
271.2R 3,636,939

CLASS 128
2B 3,636,940
2.05A 3,636,941
2.05D 3,636,942
24A 3,636,943
24.1 3,636,944
36 3,636,945
57 3,636,946
66 3,636,947
79 3,636,948
173 3,636,949
218M 3,636,950
281 3,636,953
284 3,636,951
287 3,636,952
305 3,636,955
321 3,636,954
335.5 3,636,956

CLASS 131
10R 3,636,957
82 3,636,958
133A 3,636,959
187 3,636,960

CLASS 132
9 3,636,961
60 3,636,962
112 3,636,963

CLASS 136
83R 3,637,436
120FC 3,637,437
230 3,637,438

CLASS 137
13 3,636,964
77 3,636,965
81 3,636,966
81.5 3,636,967
102 3,636,968
115 3,636,969
117 3,636,970
238 3,636,971
340 3,636,972
488 3,636,973
565 3,636,974
580 3,636,975
590 3,636,976
608 3,636,977
625.23 3,636,979
625.26 3,636,978
625.44 3,636,980
625.46 3,636,981

CLASS 138
38 3,636,982
39 3,636,983
155 3,636,984
162 3,636,985

CLASS 139
17 3,636,986
34 3,636,987
46 3,636,988
125 3,636,989

CLASS 140
92.1 3,636,990
105 3,636,991

CLASS 141
4 3,636,992
20 3,636,993
83 3,636,994

CLASS 143
32F 3,636,996
32J 3,636,995

CLASS 144
328 3,636,998

CLASS 145
33A 3,636,997

CLASS 146
81 3,636,999

CLASS 148
1.6 3,637,439
11.5R 3,637,440
32.5 3,637,441
111 3,636,579
120 3,637,442
122 3,637,443

CLASS 149
10 3,637,444
50 3,637,445

CLASS 150
3 3,637,000

CLASS 152
209 3,637,001
361 3,637,003
429 3,637,002

CLASS 156
69 3,637,446
180 3,637,447
197 3,637,448
305 3,637,449
415 3,637,450
500 3,637,451

CLASS 160
133 3,637,004

CLASS 161
15 3,637,452
43 3,637,453
44 3,637,454
49 3,637,455
64 3,637,456
140 3,637,457
160 3,637,458
161 3,637,459

CLASS 162
352 3,637,460

CLASS 165
17 3,637,005
26 3,637,006
32 3,637,007
69 3,637,008

CLASS 166
5 3,637,009
51 3,637,010
77.5 3,637,011
250 3,637,012
257 3,637,013
272 3,637,018
273 3,637,014
3,637,015
3,637,016
274 3,637,017
295 3,637,019
298 3,637,020
302 3,637,021

CLASS 169
1 3,637,022

CLASS 171
3,637,023
63 3,637,024

CLASS 172
4.5 3,637,026
52 3,637,025
311 3,637,027
582 3,637,028

CLASS 173
162 3,637,029

CLASS 174
152GM 3,637,917
158R 3,637,918

CLASS 175
65 3,637,030
66 3,637,031
73 3,637,032
320 3,637,033

CLASS 177
208 3,637,034

CLASS 178
5.2R 3,637,919
5.2 3,637,920
5.4BD 3,637,931
5.4HE 3,637,922
5.4ST 3,637,925
5.4R 3,637,921
3,637,923
3,637,935
5.4 3,637,924
6 3,637,926
3,637,927
6.6FS 3,637,928
6.6A 3,637,934
7.2 3,637,937
7.3 3,637,929
7.8 3,637,930
7.9 3,637,932
39 3,637,933
69.5CB 3,637,936

CLASS 179
1G 3,637,938
15AQ 3,637,941
15BM 3,637,940
15.55R 3,637,942
16EC 3,637,943
18AH 3,637,946
18ES- 3,637,939
18GE 3,637,944
18E 3,637,945
27FH 3,637,947
84R 3,637,948
100R 3,637,949
100.2MD 3,637,952
100.2R 3,637,951
100.2S 3,637,950
164 3,637,953
175.31E 3,637,954
175.31R 3,637,955

CLASS 180
5R 3,637,035
66R 3,637,036
114 3,637,037

CLASS 181
.5 3,637,038
31B 3,637,039
33HC 3,637,041
33E 3,637,042
33R 3,637,040

CLASS 182
2 3,637,043
141 3,637,044
155 3,637,045
170 3,637,046
222 3,637,047

CLASS 184
6R 3,637,050
6.1 3,637,048
6.12 3,637,049

CLASS 188
1B 3,637,051
62 3,637,052
71.1 3,637,053
195 3,637,054

CLASS 191
4 3,637,956
29 3,637,957

CLASS 192
4R 3,637,055
12BA 3,637,056
13R 3,637,057
146 3,637,058

CLASS 194
9T 3,637,059

CLASS 195
28R 3,637,461
66A 3,637,462
80 3,637,463

CLASS 197
6.7 3,637,060
114R 3,637,061

CLASS 198
19 3,637,062
29 3,637,063
32 3,637,064
33 3,637,065
38 3,637,066
184 3,637,090
3,637,091
203 3,637,067
211 3,637,068
213 3,637,069

CLASS 200
38CA 3,637,958
48 3,637,959
50A 3,637,960
61.86 3,637,961
3,637,962
82D 3,637,963
86.5 3,637,964
148E 3,637,965
148G 3,637,966
155R 3,637,967
168R 3,637,968
203 3,637,969

CLASS 201
6 3,637,464

CLASS 203
11 3,637,465

CLASS 204
1R 3,637,466
14R 3,637,467
15 3,637,468
26 3,637,469
29 3,637,470
43 3,637,471
46 3,637,472
3,637,473
47 3,637,474
55R 3,637,475
106 3,637,476
158HA 3,637,477
162 3,637,478
163R 3,637,479
180P 3,637,480
224 3,637,481
228 3,637,482

CLASS 206
13 3,637,070
52W 3,637,071
63.2R 3,637,072
65K 3,637,073

CLASS 208
86 3,637,483
143 3,637,484
211 3,637,485
363 3,637,486

CLASS 209
74 3,637,074
122 3,637,075
124 3,637,076
273 3,637,077

CLASS 210
5 3,637,487
22 3,637,488
31C 3,637,489
44 3,637,490
54 3,637,491
73 3,637,078
82 3,637,079
83 3,637,080
110 3,637,081
225 3,637,082
497 3,637,083

CLASS 211
105.1 3,637,084
153 3,637,085
176 3,637,086
3,637,087

CLASS 213
45 3,637,088
153 3,637,089

CLASS 214
1CM 3,637,092
6P 3,637,093
10.5R 3,637,094
16.6 3,637,095
18 3,637,096
77P 3,637,097
314 3,637,098
660 3,637,099
671 3,637,100

CLASS 215
40 3,637,101
3,637,102
3,637,103

CLASS 219
10.75 3,637,970
97 3,637,971
107 3,637,972
131 3,637,973
135 3,637,974
213 3,637,975
216 3,637,976
271 3,637,979
3,637,980
272 3,637,977
284 3,637,978
347 3,637,981
368 3,637,982
388 3,637,983
471 3,637,984
490 3,637,985
519 3,637,986

CLASS 220
25 3,637,104
53 3,637,105
54 3,637,106

CLASS 221
3 3,637,107
211 3,637,108
310 3,637,109

CLASS 222
3 3,637,110
86 3,637,113
135 3,637,114
146H 3,637,111
195 3,637,115
309 3,637,116
317 3,637,112
400.7 3,637,117
517 3,637,118

CLASS 223
39 3,637,119
73 3,637,128

CLASS 224
5A 3,637,120

CLASS 226
17 3,637,121
20 3,637,122
42 3,637,123
62 3,637,124
3,637,125

CLASS 227
3 3,637,126
9 3,637,127

CLASS 228
20 3,637,129

CLASS 229
28 3,637,130
36 3,637,131
53 3,637,132
3,637,133

CLASS 233
19A 3,637,134
141 3,638,124

CLASS 235
60.28 3,637,987
61.11E 3,637,991
3,637,993
61.11R 3,637,992
61.12R 3,637,994
61.6J 3,637,988
61.7B 3,637,990
61.7R 3,637,989
92DN 3,637,998
92FQ 3,637,996
92C 3,637,995
92N 3,637,997
94A 3,637,999
151.35 3,638,000
152 3,638,001
155 3,638,002
156 3,638,004
160 3,638,005
175 3,638,003
181 3,638,006
184 3,638,007

CLASS 239
3 3,637,135
125 3,637,136
206 3,637,139
223 3,637,137
227 3,637,138
265.43 3,637,140
283 3,637,143
326 3,637,141
394 3,637,142

CLASS 240
1 3,638,008
2W 3,638,009
3 3,638,010
6.4W 3,638,011
25 3,638,012
41.15 3,638,013

CLASS 241
100 3,637,144
189 3,637,145
194 3,637,146
299 3,637,147

CLASS 242
35.6E 3,637,148
47.09 3,637,149
54 3,637,150
55.19A 3,637,151
3,637,152
56R 3,637,154
56 3,637,153
58.1 3,637,155
72.1 3,637,156
84.2R 3,637,157
96 3,637,158
107.3 3,637,159
131 3,637,160
186 3,637,161
188 3,637,162
191 3,637,163
195 3,637,164
199 3,637,165

CLASS 244
15A 3,637,169
3,637,170
1R 3,637,166
3.21 3,637,167
7A 3,637,168

CLASS 246
91 3,638,014

CLASS 248
14 3,637,171
54CS 3,637,173
54R 3,637,174
55 3,637,175
59 3,637,176
74PB 3,637,177
145 3,637,178
188.7 3,637,179
203 3,637,180
205A 3,637,181
226B 3,637,182
235 3,637,183
279 3,637,184
425 3,637,185
460 3,637,172
478 3,637,186

CLASS 250
49.5A 3,638,015
65ZE 3,638,016
71.5R 3,638,017
83.1 3,638,018
83.3H 3,638,019
3,638,021
83.3R 3,638,020
3,638,022
106 3,638,023
199 3,638,024
203 3,638,025
211J 3,638,026
213R 3,638,027
219D 3,638,028
225 3,638,029

CLASS 251
61.3 3,637,187
120 3,637,188

CLASS 252
8.5C 3,637,492
3,637,493
8.55D 3,637,494
8.75 3,637,496
8.8 3,637,495
29 3,637,497
30 3,637,498
32.7R 3,637,499
48.6 3,637,500
57 3,637,501
59 3,637,502
3,637,503
62.59 3,637,605
62.61 3,637,504
3,637,505
62.9 3,637,506
78 3,637,507
87 3,637,508
99 3,637,509
107 3,637,510
171 3,637,513
182 3,637,514
3,637,515
188 3,637,516
301.4P 3,637,519
301.4R 3,637,517
3,637,518
316 3,637,520
326 3,637,521
328 3,637,522
356 3,637,523
415 3,637,524
432 3,637,525
439 3,637,526
441 3,637,527
454 3,637,528
459 3,637,529
518 3,637,530
520 3,637,531
3,637,532
522 3,637,533
527 3,637,511
555 3,637,512

CLASS 254
89H 3,637,189

CLASS 259
72 3,637,190
153 3,637,191

CLASS 260
2R 3,637,534
2.1 3,637,535
2.5AH 3,637,541
2.5AJ 3,637,542

	3,637,543
2.5AM	3,637,539
	3,637,540
2.5AR	3,637,537
2.5AT	3,637,536
2.5B	3,637,538
3	3,637,544
4	3,637,545
15	3,637,546
17.2	3,637,547
17.3	3,637,548
	3,637,549
18N	3,637,550
	3,637,551
18R	3,637,552
22D	Re.27,279
23TN	3,637,553
23.7H	3,637,556
23.7R	3,637,554
23.7	3,637,555
28.5R	3,637,559
28.5	3,637,558
29.2M	3,637,560
29.3	3,637,561
29.4R	3,637,562
29.6TA	3,637,565
	3,637,566
29.6H	3,637,564
29.6R	3,637,563
29.7U	3,637,567
32.6R	3,637,568
32.8R	3,637,569
33.6SB	3,637,570
34.2	3,637,571
37EP	3,637,572
37N	3,637,573
37P	3,637,575
37R	3,637,574
38	3,637,576
	3,637,577
40R	3,637,578
40	3,637,580
41A	3,637,579
41.5R	3,637,581
45.75N	3,637,588
45.8A	3,637,583
45.8N	3,637,582
	3,637,584
45.85R	3,637,585
45.85	3,637,586
45.9R	3,637,587
46.5E	3,637,589
47CP	3,637,594
47EC	3,637,591
47EP	3,637,590
47ET	3,637,593
47UA	3,637,596
47C	3,637,595
47R	3,637,592
65	3,637,597
72R	3,637,598
75NT	3,637,599
75P	3,637,898
78TF	3,637,600
78UA	3,637,603
78A	3,637,606
78L	3,637,608
78R	3,637,601
	3,637,607
78	3,637,602
	3,637,604
78.4R	3,637,609
78.5N	3,637,611
78.5T	3,637,610
79R	3,637,612
79	3,637,613
80.72	3,637,614
80.73	3,637,615
80.78	3,637,616
	3,637,617
85.5	3,637,619
	3,637,620
	3,637,621
	3,637,622
	3,637,623
	3,637,624
	3,637,625
	3,637,626
88.2	3,637,627
88.7E	3,637,628
	3,637,629
	3,637,630
92.1	3,637,631
92.8A	3,637,632
92.8W	3,637,633
93.7	3,637,634
94.7R	3,637,635
94.9C	3,637,636
94.9D	3,637,637
102	3,637,638
107	3,637,639
115	3,637,640
118	3,637,642
122	3,637,643
141	3,637,644
147	3,637,645
	3,637,646
155	3,637,647
162	3,637,648
191	3,637,649
192	3,637,650
207	3,637,651
	3,637,653
207.1	3,637,652
210E	3,637,654
211.5R	3,637,655
233.3R	3,637,656
234R	3,637,657
239AA	3,637,663
239HM	3,637,658
239B	3,637,659
239D	3,637,660
	3,637,661
239E	3,637,662
239	3,637,664
239.1	3,637,665
239.5	3,637,666
	3,637,668
239.55R	3,637,667
	3,637,670
239.55	3,637,671
239.6	3,637,669
240F	3,637,675
240R	3,637,674
240.1	3,637,676
240.9	3,637,672
	3,637,673
	3,637,677
243C	3,637,678
243	3,637,679
247	3,637,680
247.2A	3,637,681
247.5R	3,637,702
247.7A	3,637,682
	3,637,683
248AS	3,637,684
248NS	3,637,557
249.6	3,637,685
249.7P	3,637,686
249.9	3,637,687
	3,637,688
	3,637,689
250A	3,637,690
250R	3,637,692
250	3,637,691
251Q	3,637,693
251R	3,637,694
251.5	3,637,695
256	3,637,696
256.4H	3,637,697
256.4Q	3,637,699
	3,637,701
256.5R	3,637,698
	3,637,700
	3,637,703
268PH	3,637,705
268TR	3,637,706
268R	3,637,704
282	3,637,708
287R	3,637,709
	3,637,710
289R	3,637,711
293.59D	3,637,713
293.84	3,637,712
294.8R	3,637,714
294.9	3,637,715
295	3,637,716
295.5B	3,637,718
295.5R	3,637,717
296R	3,637,719
297R	3,637,720
	3,637,721
297Z	3,637,722
302D	3,637,723
304	3,637,724
306.7	3,637,725
307B	3,637,727
307D	3,637,728
307F	3,637,726
308R	3,637,729
309	3,637,730
	3,637,731
	3,637,732
309.2	3,637,733
	3,637,734
309.6	3,637,735
310A	3,637,737
310C	3,637,736
311	3,637,738
314	3,637,739
326.11	3,637,745
326.13R	3,637,747
326.15	3,637,748
326.3	3,637,741
326.5FN	3,637,743
326.5M	3,637,740
	3,637,742
326.5	3,637,746
326.9	3,637,744
327M	3,637,749
332.3C	3,637,750
340	3,637,751
340.3	3,637,755
340.5	3,637,752
	3,637,753
340.9	3,637,754
	3,637,756
343.3	3,637,757
345.2	3,637,758
345.5	3,637,759
345.8	3,637,760
346.3	3,637,761
348R	3,637,762
	3,637,765
	3,637,767
348	3,637,763
	3,637,764
	3,637,766
348.5L	3,637,768
396N	3,637,769
397.4	3,637,770
	3,637,771
398.5	3,637,772
	3,637,773
410.6	3,637,774
429	3,637,776
429.7	3,637,777
429.9	3,637,775
437R	3,637,778
448.2B	3,637,782
	3,637,783
448.2E	3,637,779
	3,637,781
448.2P	3,637,780
453P	3,637,785
	3,637,786
453R	3,637,784
454	3,637,787
	3,637,788
455B	3,637,790
455C	3,637,789
456R	3,637,791
458	3,637,792
	3,637,793
462	3,637,794
463	3,637,795
465C	3,637,797
465D	3,637,798
465E	3,637,796
465.5A	3,637,799
465.7	3,637,800
468B	3,637,801
470	3,637,802
	3,637,803
471A	3,637,804
	3,637,806
471R	3,637,805
473G	3,637,807
477	3,637,808
479C	3,637,810
479S	3,637,809
482C	3,637,811
484P	3,637,812
486H	3,637,813
487	3,637,814
488H	3,637,816
488J	3,637,815
491	3,637,817
497A	3,637,818
	3,637,819
508	3,637,820
514B	3,637,821
514N	3,637,822
514P	3,637,823
518A	3,637,824
	3,637,825
519	3,637,826
520	3,637,827
521A	3,637,828
524R	3,637,829
	3,637,830
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531R	3,637,832
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	3,637,835
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534R	3,637,839
534S	3,637,837
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543P	3,637,836
544F	3,637,842
544M	3,637,841
545R	3,637,843
551S	3,637,844
556F	3,637,845
558P	3,637,846
562B	3,637,847
563R	3,637,848
564F	3,637,849
	3,637,850
566F	3,637,851
570R	3,637,856
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	3,637,853
570.8TC	3,637,854
583	3,637,855
590	3,637,857
601R	3,637,858
601	3,637,859
604R	3,637,860
606	3,637,861
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611.5	3,637,865
612R	3,637,866
614AA	3,637,867
615B	3,637,869
615R	3,637,868
626	3,637,870
649F	3,637,871
654D	3,637,872
655	3,637,873
658R	3,637,874
	3,637,875
666A	3,637,877
666M	3,637,876
667	3,637,878
	3,637,879
668A	3,637,880
	3,637,881
668F	3,637,882
671	3,637,883
	3,637,884
677A	3,637,885
680C	3,637,886
681	3,637,887
681.5C	3,637,888
682	3,637,889
683D	3,637,890
	3,637,891
	3,637,892
	3,637,893
683R	3,637,894
683.15D	3,637,896
	3,637,897
683.3	3,637,895
827	3,637,899
830TW	3,637,902
830P	3,637,900
	3,637,901
	3,637,903
836	3,637,904
837R	3,637,618
854	3,637,905
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859R	3,637,909
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865	3,637,911

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24	3,637,193
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30	3,637,195
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122	3,637,197

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CLASS 271

27	3,637,201
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53	3,637,203

CLASS 272

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69	3,637,206
80	3,637,207

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26E	3,637,208
	3,637,209
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55R	3,637,210
85R	3,637,212
101	3,637,213
126R	3,637,214
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168	3,637,218
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214	3,637,220

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129	3,637,244

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256.69	3,637,257
262	3,637,247

CLASS 294

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88	3,637,250

CLASS 296

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63R	3,637,253
84	3,637,254

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248	3,637,256
385	3,637,259
389	3,637,258
433	3,637,260

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	3,638,038
238	3,638,039
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247	3,638,041
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252G	3,638,042
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267	3,638,045
279	3,638,046
293	3,638,047
299	3,638,048
310	3,638,049
311	3,638,050

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348	3,638,063

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27TD	3,638,067
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82	3,638,069
163	3,638,070

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100	3,638,073
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148.5	3,638,074
230	3,638,076
	3,638,077
234	3,638,078
235R	3,638,079
	3,638,080
	3,638,081
	3,638,082
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258	3,638,084
	3,638,085
260	3,638,086

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227	3,638,088
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345	3,638,090
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584	3,638,092
687	3,638,093

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45R	3,638,099
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30R	3,638,109
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146	3,638,117
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CLASS 329

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	3,636,966	3,636,963	3,637,422	3,638,070	3,637,029	3,637,655
	3,637,337	3,636,969	3,637,424	3,638,071	3,637,096	3,637,842
	3,637,982	3,636,975	3,637,443	3,638,074	3,637,114	3,638,059
4 :	3,636,567	3,636,981	3,637,449	3,638,081	3,637,201	3,638,066
	3,637,294	3,636,983	3,637,452	3,638,089	3,637,251	12 : 3,636,601
	3,637,980	3,636,991	3,637,471	3,638,093	3,637,296	3,636,696
	3,638,041	3,636,998	3,637,478	3,638,107	3,637,347	3,636,706
	3,638,170	3,636,999	3,637,482	3,638,111	3,637,411	3,636,907
	3,638,238	3,637,000	3,637,483	3,638,121	3,637,437	3,636,958
	3,638,238	3,637,004	3,637,484	3,638,122	3,637,476	3,637,032
5 :	3,637,485	3,637,007	3,637,494	3,638,126	3,637,634	3,637,053
6 :	3,636,564	3,637,010	3,637,527	3,638,128	3,637,684	3,637,080
	3,636,580	3,637,015	3,637,555	3,638,130	3,637,707	3,637,132
	3,636,585	3,637,016	3,637,618	3,638,131	3,637,740	3,637,183
	3,636,587	3,637,021	3,637,636	3,638,137	3,637,784	3,637,212
	3,636,617	3,637,028	3,637,639	3,638,140	3,637,785	3,637,220
	3,636,619	3,637,041	3,637,640	3,638,159	3,637,786	3,637,332
	3,636,631	3,637,042	3,637,641	3,638,165	3,637,788	3,637,470
	3,636,633	3,637,044	3,637,670	3,638,174	3,637,794	3,637,534
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	3,636,654	3,637,075	3,637,743	3,638,189	3,637,865	3,637,675
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	3,636,674	3,637,084	3,637,767	3,638,210	3,638,056	3,637,979
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	3,636,728	3,637,126	3,637,833	3,637,011	10 : 3,636,640	3,637,205
	3,636,746	3,637,138	3,637,848	3,637,018	3,636,678	3,637,250
	3,636,759	3,637,165	3,637,878	3,637,022	3,636,956	3,637,259
	3,636,764	3,637,167	3,637,893	3,637,031	3,637,458	15 : 3,636,615
	3,636,774	3,637,168	3,637,913	3,637,059	3,637,496	3,637,248
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	3,636,810	3,637,223	3,637,956	3,637,139	3,637,551	3,638,099
	3,636,837	3,637,245	3,637,957	3,637,200	3,637,576	3,638,100
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	3,636,874	3,637,285	3,637,994	3,637,465	3,637,614	3,636,592
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	3,636,897	3,637,299	3,638,013	3,637,985	3,637,731	3,636,644
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	3,636,916	3,637,336	3,638,025	3,636,574	3,637,873	3,636,673
	3,636,917	3,637,342	3,638,032	3,636,756	3,638,101	3,636,684
	3,636,921	3,637,343	3,638,040	3,636,863	11 : 3,636,623	3,636,707
	3,636,938	3,637,351	3,638,045	3,636,878	3,636,711	3,636,729
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